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NOVEMBER 1994

PC Computing

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XE SERIES.
THE SHARPEST,
BRIGHTEST,
MOST PRECISE
MONITORS
YOU'VE EVER SEEN.

THE ONLY THING T
FINE LINE BETWEEN

Three years ago, we embarked on a mission. To design and build the finest computer monitors in the world. Which is a rather ambitious quest. After all, many industry experts already considered the NEC MultiSyne monitor, first introduced just over a decade ago, pretty darn close to perfect.

Now, for a company known the world over for technological achievement, our mission was relatively untechnical: To build a line of computer monitors that were so crystal-clear, so brilliant, so easy to control, people would actually look forward to working with them.



NEC offers integrated accessories for enhancing X Series monitors including AudioTower speakers and Monitor Lens.

The result? NEC is proud to introduce the MultiSyne XE Series of Monitors.

To make things perfectly clear, these monitors feature our unique OptiClear™ surface that virtually eliminates glare, an Invar shadow mask that assures maximum brightness without loss of focus, and a super fine .28 mm dot pitch. In addition, the XE Series features flicker-free, rock-solid refresh rates of up to 120Hz.

Then we packed them with features that make them easier to work with. Our On-Screen Manager, OSM™ for short, offers on-

*When used with Plug and Play compatible hardware and Microsoft Windows™ 4.X.

HEY BLUR IS THAT
WORK AND PLAY.

screen controls with animated icons that visually demonstrate your options. OSM allows you to control everything from screen geometry and screen size to color temperature. (A veritable field day for Type A personalities.)

We're also the first to offer compatibility with the new Microsoft® Plug and Play standard, which virtually eliminates configuration headaches while it automatically optimizes the monitor's performance*. MonitorManager™ software allows you to switch resolutions (for Macintosh®), utilize power management, and control color. People who spend all day in front of a monitor will be very, very pleased.

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15" CRT, 13.8" viewable image size
Max Res: 1024 x 768 NI @ 76 HZ

XE17
17" CRT, 15.6" viewable image size
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XE21
21" CRT, 19.8" viewable image size
Max Res: 1280 x 1024 NI @ 60 HZ

Every NEC monitor is backed by a three-year limited warranty. More importantly, it's backed by NEC's reputation for building the finest monitors in the world.

The new MultiSync XE Series from NEC. If you spend a few moments with one, we strongly believe you will never again think that "enjoy work" is a contradiction in terms.

For more information or the name of the nearest dealer call 1-800-NEC-INFO. For information sent directly to your fax, call 1-800-366-0476. Just ask for our document number 9301.

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Circle 182 on reader service card.


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hordes or pilot a jet plane. With the Presario 900 series, you can do it all right out of the box. Even with everything that's on it, there's still plenty of room to grow. You can upgrade the processor (to Pentium technology), the memory (to 100MB) and the hard drive (to more than a gigabyte). You can add up to 128KB of secondary cache. And you can plug whatever it is we may have left out into any of the five available I/O slots and drive bays. It's time, all right. Time to play.

COMPAQ

Circle 109 on reader service card.

PC Computing NOVEMBER 1994 VOLUME 7 NUMBER 11

COVER STORY

CD Revolution

CD-ROM technology is no longer an option. It's a potent weapon that no business arsenal should be without. Here's how to arm yourself.



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CD-ROM in Overdrive



CD drives give you the edge you need. From speed-demon access to creating your own own discs to taking them on the road, today there's a CD drive for every purpose. **138**

Best CDs for the Job



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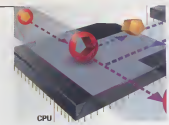
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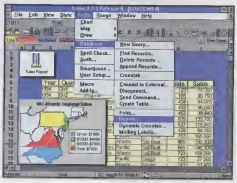
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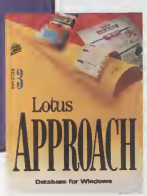
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PC/Computing, July 1994.

1-2-3 Release 5:
"As good as spreadsheets get."
Computer Reseller News, August 29, 1994.

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Windows Magazine, August 1994.

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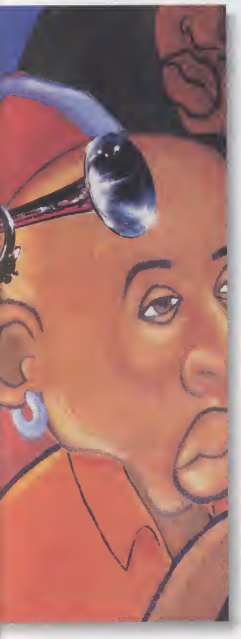


720 dpi

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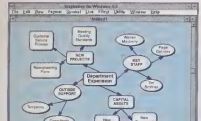
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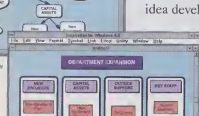
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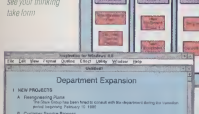


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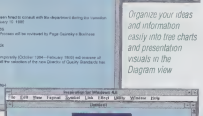


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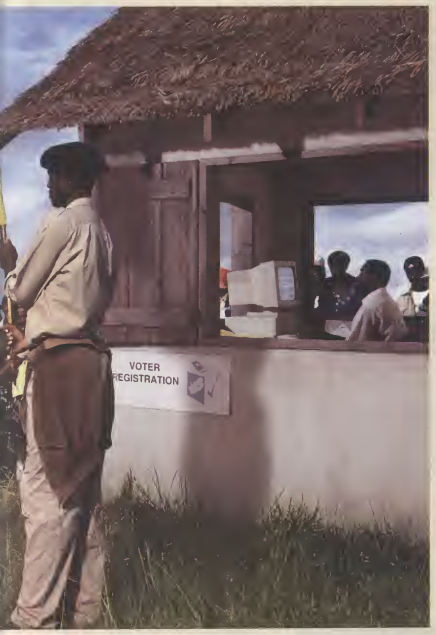
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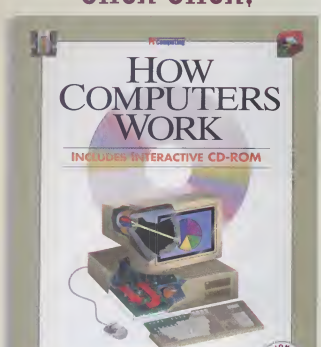


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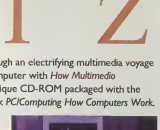
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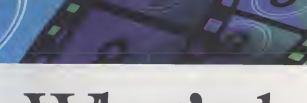
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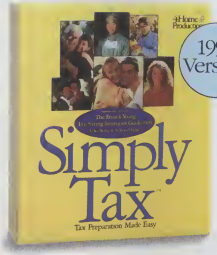
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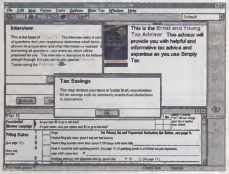
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NOT GOING TO TAKE IT ANYMORE

Plug and Play: Make It So

Home computing is an oxymoron. User friendly? The average consumer has enough trouble setting a VCR timer. Until true plug and play arrives, a computer in every home is still a pipe dream. Is there an audio tape deck for sale anywhere that doesn't hook up easily to any receiver sold in the past 30 years with a cable from Kmart? No! There is true plug and play in the audio hi-fi world. IRQs, DMAs, conventional memory shortages, GPFs, PIFs—get real! Get together and set some standards. DOS was OK for PC infancy, but since the 386 it has only held back the progress toward true plug and play.

BOB CHRISTOPHER
COVENTRY, RHODE ISLAND

Online About-Face

I disagree with the conclusions of your "Going I-Way" feature (September, page 120), especially the "Online Fever" section. America Online has a great interface, but a pretty face does not a good online service make. Some key points:

1. It may be easy to send e-mail from America Online, but it's a pain to read incoming mail. Didn't anybody notice that America Online doesn't let you read your mail offline (unless you have a third-party add-in)? CompuServe's WinCIM interface is far superior. It lets you read and write your mail offline, and it has a tool to send and receive mail automatically.

2. There is a scaled-down version of the navigator built into the WinCIM program. This "Autopilot" is an undocumented feature that lets you gather forum messages automatically.

3. America Online's Internet access is rather limited.

HANS SANDBERG
CIS: 70274,2657

COMPUSERVE USERS' ability to read Internet mail offline—a feature that became available only after our September issue was in the mail—is a big point in that service's favor. However, until the ability to work offline is accessible in its help menus (see following letter), it doesn't matter how easy it is to do if no one knows it's there. As for limitations, neither America Online nor CompuServe claims to offer full Internet access, nor was America Online designed to be an interface to the Internet. Some software packages that *were* designed to be Internet interfaces don't let you work offline either. Undocumented features are fine for clairvoyants. However, we do usability testing because we're pretty sure most of our readers have just the five senses. **HB**

Where's the Offline?

We'd like to address some of the claims made in the "Online Fever" section of your September "Going I-Way" feature, especially to CompuServe's offline capabilities. The CompuServe Information Manager (CIM) does let members create, edit, and reply to both forum and e-mail messages offline. In addition, messages can be sent in batches from a member's "out basket," thus allowing users to log on and off quickly and save money. While online, members can move e-mail and forum messages to the "in basket" or "filing cabinet" for later review offline. In fact, messages can be marked for downloading, and after downloading, CompuServe can even end the session automatically.

DEBRA YOUNG
COMPUSERVE

THANKS for calling this to our attention. As the story states, online services don't do a lot to call attention to their offline capabilities because they don't make money from them. If you go to WinCIM's Help section, there's nothing under either "offline" or "working offline." Nor is there any offline information in CompuServe's user manual. **HB**

Wishful Thinking

I read your report on the Cyrix 386 to 486 upgrade, "Light a Fire under Your Old 386" (page 56), and I hope you will do a similar test for a 286 to 486 upgrade. So far, I have only seen ads for the Cyrix 286 to 486 Make-It-486® upgrade, but I wonder if there is any other way to do it. I have an old 286 that I would like to upgrade if it is feasible.

PETER KUNG
OAK RIDGE, TENNESSEE

TOO MANY LEAPS. Sorry, but even the well-engineered Cyrix upgrade can't go back two generations to a 286. The Cx486DRx2 works in a standard 132-pin PGA socket and the Cx486SRx2 mounts atop a standard 386SX. Sounds like it's time for you to take the plunge and get a new system. **AM**

How Do You Spell Relief?

I read your August review of the new Cyrix upgrade chips and wondered, why buy a Cx486DRx2 or Cx486SRx2 when you can easily find a brand-new 33MHz 486SX motherboard at a local computer show for $150? A motherboard replacement gives you a true (and faster) 486 processor, updated BIOS, VESA local bus or PCI slots,

upgradability with a ZIF socket, and possibly a bigger RAM cache. Plus, it's easier to pronounce than *Cx486DRx2.*

SON NGUYEN
LANCASTER, PENNSYLVANIA

WHERE DOES IT END? Once you swap out the motherboard (a time-consuming operation compared to the Cyrix upgrade), you'll want a newer, faster video card. Then a bigger, better hard drive. Eventually, all you'll have left is the case. Come to think of it, you can upgrade that, too. Changing your CPU is a way to dip your toe into the upgrade pool, but if you want to swim a few laps, why, we certainly understand. **RN**

All Revved Up, No Place to Go

PC Computing often exhorts its readers to upgrade their hardware, so how about publishing an article addressing what to do with the old hardware? Some computer journalists favor treating software versions like automobile models. If hardware were also treated this way, we could trade our old devices for the upgrades.

D. STOCKTON
ANNANDALE, VIRGINIA

ANYTHING IS BETTER (socially and environmentally) than just throwing away an old PC, but the car-to-hardware analogy breaks down in more places than a vintage Yugo. As we've mentioned in the past, if you want to do some good, try giving old PCs and peripherals to a school or to the National Cristina Foundation, which delivers donated computer systems to the needy (800-274-7846 or 203-622-6000). Could be a tax write-off, too. **EB**

The Year in Reviews

Do you publish a yearly index for *PC Computing*? An index makes it much easier to find that article on tips for XYZ software than trying to remember which issue it was in.

HEATHER HARDIE
PRINCE GEORGE, BRITISH COLUMBIA

SURE DO. Download PCC93.EXE from CompuServe's Computer Shopper Forum in ZiffNet. **JOC**

We Deliver for More

A few days ago I received my first copy of *PC Computing*. I was amazed at how much I learned from that August issue. If this is what I have to look forward to in future issues, you can rest assured that someone is reading from cover to cover. Your "1,001 Tips" (page 106) was especially useful in learning how to get around several problems that I have been recently experiencing. If it's possible, I would like to acquire a copy of "1,001 Tips" on a 3.5-inch disk to keep for reference.

DONALD WRIGHT
AVENEL, NEW JERSEY

Downloads Fast, Less Ads

I find articles such as your August "1,001 Tips" extremely useful, but it would help many of us to be able to get the articles sans advertising. A nominal fee could be charged. The articles could be faxed, mailed, or downloaded.

PASQUALE J. BARATTA
PLEASANTON, CALIFORNIA

WE CAN'T FAX information to our 900,000 or so subscribers, but we have made 1,001 Tips available on CompuServe in ZiffNet's PC Contact forum. You can also call Public Brand Software at (800) 426-3475 or (317) 856-7571 and ask for the August disks, which contain a few of the 1,001 files. The four August disks cost $13.95, plus shipping and handling. See page 262 for more information about PC Contact and how to download files. **JOC**

PCs Play No Games

John C. Dvorak has it backward in "Chip Shots" (August, page 43). The PC is a fine processor and number cruncher. Its shortcomings are revealed when it is used as a game platform or movie viewer.

ROBERT A. WILEY
SOLON, IOWA

On the Front Line

I know Ziff-Davis has its hands in several publications, but I see *PC Computing* as the 4077th M*A*S*H. There are others, but for some reason this one really works! It's crazy, sometimes a little wild, and at times you're not afraid to buck the "big boy." I know advertising pays the bills, and I appreciate the balance you maintain between tact and your obligation to the reader.

HARDY DAVIS
CORPUS CHRISTI, TEXAS

Ups and Downs

Can someone please EXPLAIN TO ME why your magazine has an obsession with the use of RANDOM CAPITAL LETTERS? At first, I thought it was JUST A PHASE, but now it has persisted for THREE WHOLE MONTHS. I always THOUGHT that capital letters were supposed TO SHOW EMPHASIS, not just lie HAPHAZARDLY about in the middle of sentences. This has become an EXTREME ANNOYANCE. Anyone care to COMMENT?

KEITH J. TELLER
SOUTHFIELD, MICHIGAN

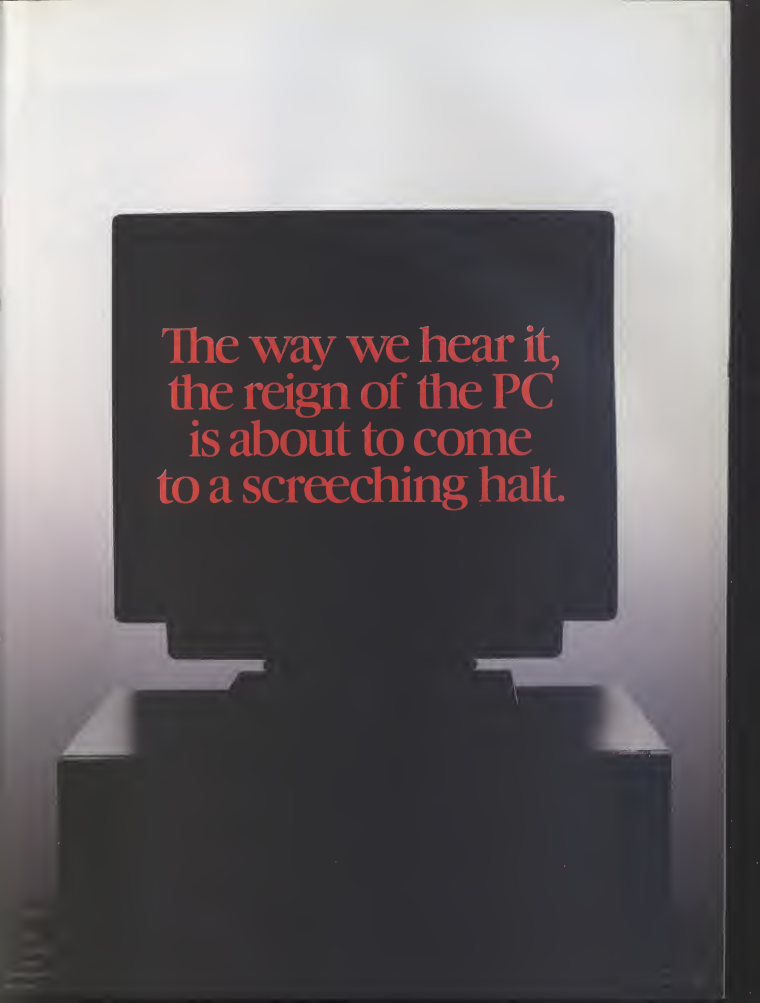
IT'S these darn STICKY keys . . . **JOC**

Apple Bites Back

I was amused by Ed Bott's August column ("Seismic Software," page 39). He says people were abandoning the Macintosh in droves. Apparently, he just visits this planet every few years. Apple has sold more PCs than any other computer manufacturer for the last two years. This year, the Macintosh attained the price and performance advantage with the PowerPC, and it has already manifested itself in Apple financial statements by earnings of more than twice analysts' estimates. It would have been more correct to say Compaq's Presario has gained market share faster than the Macintosh this year—even then, only modestly. Check the numbers. I have.

MITCHELL PARKS
IRVING, TEXAS

ANY GOOD ANALYST will tell you past performance is no indicator of future results. Apple made a lot of money selling PowerBooks to a notebook-starved user base in the last couple of years. Meanwhile, the fastest-growing market segment—home and small-business users—has demonstrated its preference for cheap PCs instead of Macs. And as long as the Mac is a high-priced, closed architecture, that trend will continue. **EB**


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Who's Bashing Whom?

As for Penn Jillette's August column, "Tolls for Thee?" (page 320), it's getting boring to read Internet gods bash the novices out here. Everybody who has a lifetime membership card in the great halls of computerdom seems to imagine themselves as the William F. Buckley Jr. of e-mail. Most individuals would consider it interesting (and dare I say it, exciting) to be invited to actress Terri Hatcher's/Lois Lane's house . . . even if only to talk about going online.

GUY OWEN
HYATTSVILLE, MARYLAND

ONLY IF she can use *sesquipedalian* in a sentence as effortlessly as Buckley. **JZ**

Barking Up the Wrong Tree

The supposedly humorous column at the back of the book is disgusting. You have employed a man who refers to himself as a "big ugly son of a bitch with a square head." I don't believe any man should refer to himself in this manner at any time, particularly in a publication of your repute. The family is the basis of our country and, to me, there is too little respect for family values in many of our public venues. I feel certain that you have within your staff a real live person and not the offspring of a dog.

RALPH M. JEROME
PEACHTREE CITY, GEORGIA

SORRY, BUT we only use muzzles on bona fide canines. **JZ**

Corrections

- In "Dialing for Data" (September, page 166), the location of the file BBS.ZIP should be identified as being in ZiffNet's Computer Shopper Forum.
- The contact number for WordScan Plus 3.0 (September, page 92) should be (800) 422-5372.
- The table accompanying "Online Fever" (September, page 161) misrepresents CompuServe's membership and Prodigy's pricing. CompuServe does not count each household as six members. Prodigy costs $14.95 per month for access to news, sports, weather, closing stock quotes, children's features, shopping, and most of its other features. This price now includes five hours on four *extra* features (bulletin boards, Eaasy Sabre, Dow Jones Company News, and daytime stock quotes); additional hours for these four features cost $3.60 each.

SEND YOUR THOUGHTS TO Mail, *PC Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404; fax us at (415) 578-7029; contact us via the Internet (72241.2451@compuserve.com) or CompuServe (72241,2451); or log on to PC Contact to post a public message (see page 262 for instructions). Letters must be signed and include a daytime phone number. If you contact us through e-mail, please include your phone number, city, state, and authorization to print your e-mail address. All letters become the property of *PC Computing* and will be edited for length and clarity. For technical questions, please send e-mail to CompuServe 76000,21.

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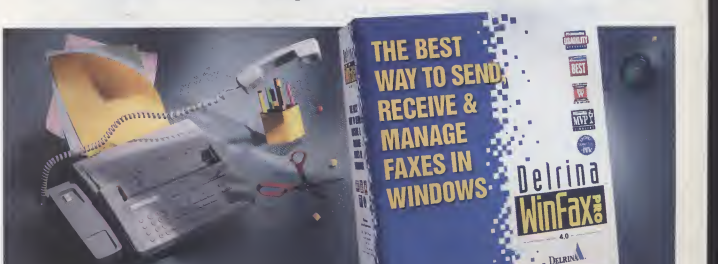
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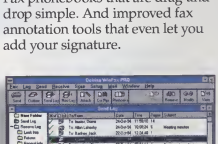
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Coming Soon



IT'S THAT TIME AGAIN Vendors are busy writing acceptance speeches as we prepare to announce 1994's best products. Of the thousands of products our editors review every year, only a few earn our MVP Award. Here are highlights from our leading categories.

SYSTEMS From desktops to servers to notebooks and subnotes, our editors have found the machines that meet the needs of the mobile workforce.

PERIPHERALS Colorful printers, sharp monitors, and precise scanners are just some of the products for you to add to your system.

APPLICATION SOFTWARE Apps continue to get more powerful, but only a few match that power with top-notch usability that truly helps you get the job done.

SYSTEM SOFTWARE As Windows adds more functions, and competitors mount challenges, your operating system becomes richer and packed with more features.

NETWORK SOFTWARE AND ONLINE SERVICES Internet is the rage. E-mail is a necessity. And groupware has finally arrived.

MULTIMEDIA AND GRAPHICS With all that CPU cranking, multimedia applications and graphics presentations are powered up to help you win business.

INNOVATION, USABILITY, AND BEST PRODUCT Innovation advances, usability improvements, and the product that impressed us the most.

VIDEOCONFERENCING Ready to reach out and watch someone? Videoconferencing has finally arrived with a flourish. With shared whiteboards and screens, these Windows-based applications help narrow the distance between you, your colleagues, and your customers.

USABILITY SOLUTIONS After testing hundreds of products in our state-of-the-art Usability Labs, we've developed some strong ideas about what's important. We'll show how you can apply what we've learned in the labs to make better product purchasing decisions for your office.

TECHNOHOLIDAYS Making a list? Checking it twice? *PC Computing* casts a discerning eye over the wares on the PC market to help you come up with a gift for your favorite propeller head.

ALSO NEXT MONTH

Windows 95 What are the implications of upgrading to Microsoft's new operating system? We discuss financial and human aspects of changing the way you work.

DOS Jeff Prosise shows you how to play music through your old CD-ROM drive.

New! Two groupware products to get your teams in sync. Plus, we look at a product that provides fax, printer, and copier—in one desktop device. And the new, easier to use OS/2.



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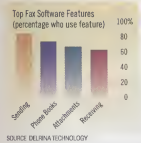
Pulse

Is V.fast an Impulse Upgrade? Plus: Bargain CD-ROM



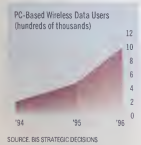
SOURCE: LAPTOP EXPOSITIONS

Presenting Laptops: In three months, demand among buyers at the Lap & Palmtop Expo for multimedia presentation peripherals rose by more than 50 percent.



SOURCE: DELPHA TECHNOLOGY

More Give Than Get: The most popular fax software sends faxes more often than it receives them. And the fastest-growing activity is sending attachments to faxes.



SOURCE: BIS STRATEGIC DECISIONS

In the Air: While its volume doesn't approach that of pager and cellular phone use, PC-based wireless data transfer is poised to hit the big time.

MODEM MONEY ISSUES

V.fast, Not V.simple

Over the long haul, V.fast and V.34 modems can save you a small fortune in phone bills. But the cost of entry to the 28.8Kbps ball game will cost you upward of $700. Consider these eight issues before buying one of these wonders:

1. Is the standard standard? V.fast is a loose specification, not a standard; the V.34 protocol was ratified in September. (Care to sponsor a bug watch?) It will take months of driver programming before most software works with any of V.34's anticipated 250 vendors. To muddy the waters, nearly one million prestandard V.fast Class (or V.FC) modems are already out there, selling for $200 mail order. Who knows if these will ever have an upgrade path?

2. Fast fax? Fax speeds still top out at 14.4Kbps. If you do more faxing than data transmission, save the extra money and get a 14.4Kbps fax modem.

3. Who you gonna call? Major online services like CompuServe won't hurry to exceed 14.4Kbps (and will charge the earth for it when they do). Smaller bulletin boards are likely to jump up sooner.

4. Dirty phone line? Highly trafficked phone lines drop your transfer rates. If your line's among them, you won't realize V.34's potential at all.

5. Slow serial port? Don't use an external V.34 modem if your system's UART is 8250A and 16540 class. It won't even exceed 9,600 bps. Make sure you have a 16C550 UART, or use internal V.34 modems.

6. Running a 33MHz 386? Spend your upgrade bucks on a new processor. Old clunkers hold V.34 transfers back.

7. Slow drivers? Windows 3.1's COMM.DRV driver tops out at 9,600 bps. Check the file date to see whether your Windows fax software provided a faster COMM.DRV.



Take Two, They're Small: V.fast and V.34 modems are fast—but you can't bet that there's one on the other end of the line.

PHOTOGRAPH BY ARNOLD TOSKI.O

UPDATES Best Bets and Bargains

CD-ROM TO GO
IBM's new $7,250 ThinkPad 755CD packs a full-sized, dual-speed CD-ROM drive that can be hot-swapped with its floppy drive. Contact IBM at (800) 426-7695.
Reader Service No. 601

$249 MPC2 KIT
The Extreme Multimedia Kit has a dual-speed CD-ROM drive, 16-bit sound, and shielded speakers. Another $50 gets you 11 CD-ROMs. Contact Megamedia Computer at (800) 634-2633.
Reader Service No. 602

CONFERENCE CALL
Videoconference with a shared whiteboard over ordinary phone lines with MegaMotion's video card, 28.8Kbps modem, and software. Contact Alpha Systems Lab at (714) 252-0117.
Reader Service No. 603

TREE TOOLS
Xtree Gold is back under Windows, and now it pumps up your File Open dialog boxes. Plus, More PC Tools—worth the $49 cost just for CrashGuard 2.0. Central Point Software, (800) 964-6896.
Reader Service No. 604

8. Pinching pennies? V.34's sub-$800 prices can't compete with $110 14.4Kbps modems.

V.34 may be the last modem standard before easy-to-use digital phone jacks—ISDN—are a reality. But that day is a long way off. Until then, V.34 can talk at more than 100Kbps (with data compression). This is enough to make remote database replication almost bearable. But be prepared to bear the costs. **MH**

2-X's Company With NEC, Teac, and Toshiba spinning quad-speed CD-ROM drives, other vendors fear nobody will give a 4-X for their 2X drives. So prices are on the wane: Catch an external Chinon CDX 535 for about $329 ($279 internal). Or watch for NEC's new internal drives: The basic 2Vi kit costs you $189. The $309 2V Deluxe uses the Sound Blaster SCSI and packs Myst and SimCity. **ML**

Take Notes, Class Not everyone in the workgroup needs to create Lotus Notes databases, so spend a fifth of what it costs for a full Notes license on the $99 Notes Express for your group's data consumers. You get all the viewing and security, but none of the design tools. **ML**

Take Subnotes New subnotebook models with 9.5-inch active-matrix color LCDs, 200MB hard drives, and multiple card slots are driving down prices of early models. Gateway 2000 monochrome 40MHz 486DX2 Handbooks now go for $1,499; 33MHz 486SXs are $999. Compaq's once-$1,399 Centura Aero is also now under $1,000, and IBM, NEC, Toshiba, and Zenith are trimming prices to catch up. **MH**

PC Cards on the Table

Run the same PCMCIA **Type I, II, and III** cards in your portable and **desktop PCs** with **CardBay,** a 3.5-inch internal rack with up to four PCMCIA 2.0 sockets. CardBay-PCI costs up to $299; there's also a $155 ISA version. **Plug-and-play** installation and a graphical drive-status monitor raise the usability stakes.

CardBay / Cardwell International Corp. / (916) 985-1880 / $155 to $299 / *Reader Service No. 605*

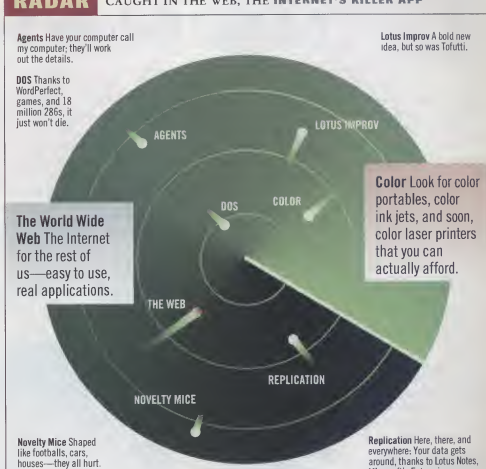
What Price Pentium Now?

Here are prices as of August 29 for a PCI-based P90, 1GB drive, 16MB of RAM, 17-inch monitor, CD-ROM, 2MB of video RAM, Sound Blaster compatibility, and speakers:

Vendor	Price
Micro Professionals *(800) 800-8300*	$3,503
PC Importers *(800) 886-5155*	$3,715
System Dynamics Group *(800) 324-1441*	$3,869
Mitra Systems *(800) 324-1441*	$3,913
Royal Electronics *(800) 486-0008*	$3,995

Reader Service Numbers: Micro Professionals *606*; Mitra Systems *607*; PC Importers *608*; Royal Electronics *609*; System Dynamics Group *610*

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Agents Have your computer call my computer; they'll work out the details.

DOS Thanks to WordPerfect, games, and 18 million 286s, it just won't die.

Lotus Improv A bold new idea, but so was Tofutti.

Color Look for color portables, color ink jets, and soon, color laser printers that you can actually afford.

The World Wide Web The Internet for the rest of us—easy to use, real applications.

Novelty Mice Shaped like footballs, cars, houses—they all hurt.

Replication Here, there, and everywhere: Your data gets around, thanks to Lotus Notes, Microsoft's Enterprise Message Server, and other newcomers.

What's on the Scope? If it's near or moving toward the middle, pay attention to it. If it's moving off the screen, forget about it for now. Your time is too valuable. **RN**



Projecting the Right Image

You've been there before and wish you hadn't. Your well-crafted PC presentation and state-of-the-art active-matrix projection panel bombed big time because your clients gave you a dim, unevenly lit overhead projector.

With the recent proliferation of luggable LCD overhead projectors that weigh less than 30 pounds, this sort of embarrassment need not happen again. Models fall into two categories: lightweight (less than 20 pounds) lens-based units like Proxima's Desktop Projector DP2800 (above) and NEC's MultiSync MT, and bulkier models with a built-in panel like Dukane's MagniView 864.

Both types of projectors pack wattage galore from halide lamps and pump out signals with 2 million colors from VGA, Mac, or NTSC video input. The Desktop Projector DP 2800 and MagniView 864 add built-in speakers and audio line outs to hook to public address systems, and the MultiSync MT goes as high as 800-by-600 resolution. **ML**

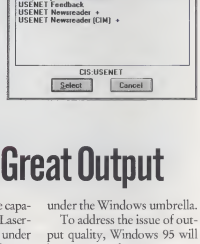
Desktop Projector DP2800 / Proxima / (617) 457-5500 / $8,995 / *Reader Service No. 611*

MultiSync MT / NEC / (800) 632-4636 / $11,995 / *Reader Service No. 612*

MagniView 864 / Dukane / (708) 584-2300 / $8,495 / *Reader Service No. 613*

CompuServe Nets Newsgroups

Following on the heels of America Online, **CompuServe** is now providing access to **Internet USENET Newsgroups.** And to avoid some of the flames that burned AOL's Net pioneers, the GO CIS:USENET forum provides a Miss Manners–style **netiquette guide.** Of course, with the $9.60-per-hour premium on Net access, CompuSurfers will need to be reminded of their manners. One thing's for sure: With these services in place, **World Wide Web access** expected from Microsoft's Marvel service next year, and **Point-to-Point Protocol** built into Windows 95, we'll all be tangled in the Net pretty soon.



WINDOWS 95 PRINTING

Cut! Print! The Font of Great Output

CHICAGO WATCH

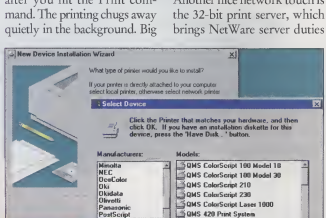
Two things are at the top of everyone's printing wish list: make it simple, and make the output look like you think it should. If all goes well, when Chicago ships in the middle of next year—with the now-official title of Windows 95—we'll all get the printing services we need.

For starters, Windows 95's print infrastructure has a 32-bit preemptive spooler that should return you straight to your app after you hit the Print command. The printing chugs away quietly in the background. Big deal. We've had that same capability for five years with LaserTools' PrintCache—first under DOS and now under the 3.*x* flavors of Windows.

More impressive is Windows 95's easy deferred printing, which stacks up all of your portable PC's print jobs on the road and cranks them out en masse as soon as you dock at mission control. That and point-and-print network printer selection constitute major productivity enhancers. Another nice network touch is the 32-bit print server, which brings NetWare server duties under the Windows umbrella.

To address the issue of output quality, Windows 95 will have two enhancements to match what you see onscreen with what you'll get on paper. By licensing Kodak's Image Color Matching (ICM) technology, Microsoft has taken steps to overcome the disparities between screen color and the output color of whatever printer you're using.

Windows 95 also deals with screen/output disparity in text. With fonts, especially fancy ones, steppy characters onscreen can be smoothed out in a barely perceptible way that makes type more readable. Font smoothing is a systemwide option that you call up from the Display Properties dialog box. The smoothing technique, called anti-aliasing by typographers, has the side effect of making the screen's text seem more like printed text. **ML**



Color Prints: Printer connection will be Wizard-driven—and color management will ensure matching output.

Contributors to Pulse: MIKE HOGAN, JAMES OLIVER CURY, RAPHAEL NEEDLEMAN, AND RICHARD SCHWERIN
Edited by MATTHEW LAKE

PHOTOGRAPH BY ARNOLD TSOBLIO

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SpeedStar 64. SpeedStar 64 with CorelDRAW 3.0, the easy to use starter graphics system. Speeds up Windows with true color graphics that are flicker free. Great for game players

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THE NEW COMPAQ LTE ELITE. ALL THE FEATURES YOU ASKED FOR. FROM THE DIFFICULT~

At Compaq, we always try to give you the notebook features you've asked for. Even if your requests do seem to stretch the laws of physics. Case in point: the Compaq LTE Elite.

To begin with, we actually found a way to get rid of that bulky AC adapter that you've always had to carry. We built the LTE Elite to have its own **built-in AC adapter,** so when you travel, all you need is a thin power cord.

At your request, we also designed it to be easily expanded. The LTE Elite gives you a choice of fast 486 processors (up to 75MHz) and a **removable hard disk.** It also has **PCMCIA** slots that let you use over 140 Compaq-tested cards. And almost every key component is **upgradeable;** the memory, the display and the processor itself.

We even designed the LTE Elite to make things easier in the office – with the SmartStation and MiniStation **expansion bases.** Both of these options feature built-in networking* and SCSI-2 capabilities for an instant desktop configuration– with ports for your full-sized monitor and keyboard. The SmartStation also adds expansion slots and bays, a spare battery charger and motorized docking.

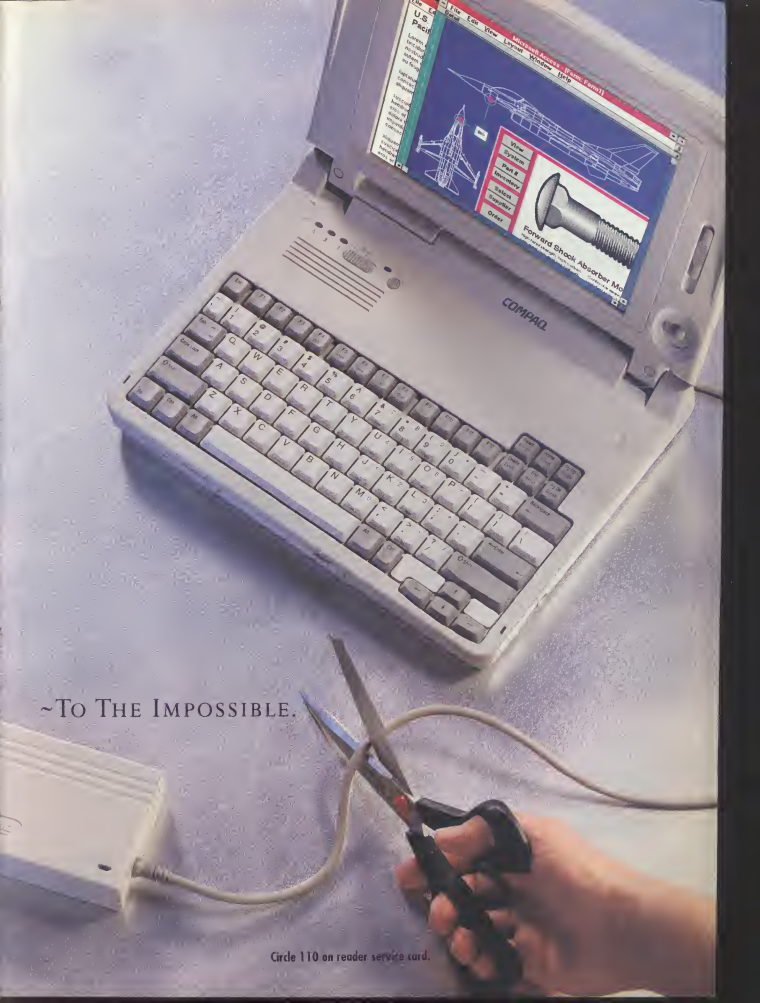
Of course, the LTE Elite also provides the peace of mind that comes with the Compaq **three-year warranty**** and free **24-hour helpline.**

If you'd like complete information, you're invited to visit a nearby authorized Compaq reseller. Or, to receive LTE Elite specifications via fax, simply give us a call at 1-800-345-1518, choose the free PaqFax option and select document #4023.

With the LTE Elite, you'll find it's hard to make a wrong decision. If not impossible.

COMPAQ

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Circle 110 on reader service card.





New ScanMan **PowerPage**® from Logitech™ is a scanner, fax machine and copier in one — all for less than the cost of a flatbed scanner! Use it with your fax modem and it acts as a fax machine, accepting hard copies like a fax machine would...connect it with your laser printer, and it works just like a copier. As a scanner, it handles full, small and odd-sized pages. Unsnap the top, and you can even scan bound materials. *And* because it's boardless, there are no installation problems — simply plug it into the parallel port on your desktop or portable computer. For more information on this all-in-one office companion, or for a dealer near you, call **1-800-889-0044.**

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"...THE EASE WITH WHICH THE POWERPAGE FAXES, PHOTOCOPIES, DOES OCR, AND GRABS GRAPHICS IS UNPARALLELED." *PC Computing 5/94*



Whether you need a color, black+white, or boardless handheld scanner, Logitech has the right scanner for you. And with OmniPage®, Direct Anyfont™ OCR, PaperTouch, and AutoSketch, Logitech scanners have the features you'll need.







Circle 149 on reader service card.

LOGITECH

The Senseware™ Company

Paul Somerson



Dear Santa:

The holiday season is just around the corner. My virtual stocking is hung from the chimney with care. But please, this year, **NO MORE** novelty mice, CD-ROM shovelware, bondage-device spine supports, kiddie fonts inspired by cartoon characters, goofy backless posture chairs, clip art collections from the '50s, or sappy screen savers. If you need a little extra time to find **JUST THE RIGHT STUFFERS**, my list follows.

• Speech-to-text software that transcribes my voice mail so I can skim it instead of having to waste hours listening to morons from Palookaville ramble on about new **WORM-FARM MANAGEMENT** software.

• A small, sturdy, lightweight notebook with a big battery and keyboard, built-in RJ-11 port, and bright color screen that doesn't fade in direct sunlight like **CHEAP UPHOLSTERY**.

• A big enough hard disk so I don't have to keep erasing critical files just to install the latest 50MB PIM that I'll end up deleting anyway.

• An online service that doesn't sit idle half the time drawing dopey bitmaps, and that edits content so I don't have to wade through **ENDLESS OORKY FLAMING** just to get to the three coherent messages.

• A fast, plain-paper color printer that handles duplex without grief and doesn't produce smeary black text that looks like an **AGING TATTOO**.

• An easy way to map my favorite keyboard shortcuts onto all the software I use without resorting to **NIGHTMARISH HOURS** of customization and hacking.

• A law requiring easy modem connections in every **HOTEL ROOM** and power outlets under all **AIRPLANE SEATS**.

• Another law that will ban monster transformer bricks, parallel ports that aren't pass-through, PCMCIA modem pigtails, software demos that don't let users escape, and all **FLOPPY-DISK SOFTWARE INSTALLATIONS**.

• A universal mailbox that actually works.

• A bulk feeder for my business-card scanner that doesn't force me to sit there **PUSHING CAROS THROUGH** it one at a time, slower than I could type them in.

• A scanner/OCR bundle that works properly more than 90 percent of the time.

• Painless file synchronization so I don't end up with three sets of **MAOOENINGLY DIFFERENT** documents on the three systems I use.

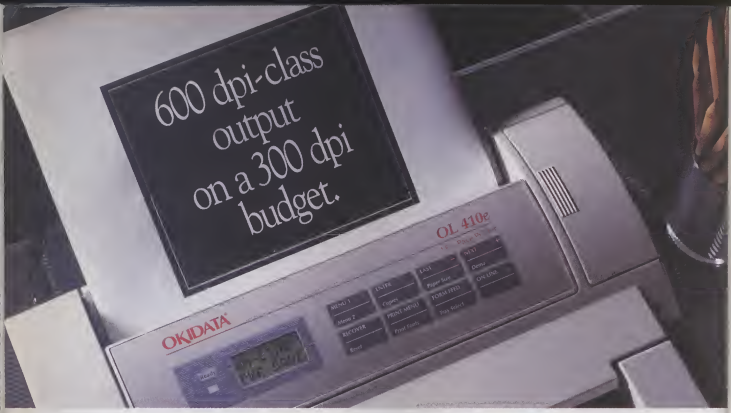
• Smart software that has a switchable step-me-through *learn* mode and a get-out-of-my-way *expert* mode, and that never ever requires a manual. Plus online help that's not **MORE TROUBLE** than it's worth.

• The end of the **GREEN PC CRAPOLA** that forces me to wait endlessly while my printer warms up each time.

• A chance for garage software companies to succeed again without already having a **BUNCH OF FERRARIS** in the garage when they start.

• A culture shift so the initials *PC* stand only for Personal Computer.

PHOTOGRAPH BY JAMES McGOON



Now PC users and Mac users alike can print 600 dpi-class, presentation level output at a simple text-and-graphics price.

Both the OL410e and the OL410e/PS with Adobe® PostScript™ are designed for laser-class output, so you can produce great looking sales presentations, newsletters and direct mail flyers easily and affordably.

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Ed Bott



Risky Business

Did you hear the one about the squirrel that shut down the NASDAQ computerized stock-trading system for 34 minutes in August? It's no joke, especially for the now-deceased rodent, who picked the wrong piece of cable to gnaw on while scampering about outside the stock market's computer center in Trumbull, Connecticut.

According to news reports, the sudden blackout caused trade reconciliation algorithms to fail, sending the system into overload. A supposedly fail-safe backup power supply didn't switch on, either. Oops.

This wasn't the first computer-related problem at NASDAQ in 1994; it was just the first to make the *Wall Street Journal* and the *New York Times*. But for anyone who subscribes to the Risks Digest, it was a familiar story. If you haven't heard of the Risks Digest, you're not alone. It's the by-product of one of thousands of Internet newsgroups. Its official name—the Forum on Risks to the Public in Computers and Related Systems—doesn't exactly roll off the tongue. And its sponsoring body, the Committee on Computers and Public Policy of the Association for Computing Machinery, isn't exactly a household word.

Moderation Is a Virtue Most newsgroups provide a virtual soapbox to anyone with a modem and two brain cells to strike together. But the Risks Digest is a moderated newsgroup, which means that every word has to pass the editorial scrutiny of moderator Peter G. Neumann. Contributions that aren't "relevant, sound, in good taste, objective, cogent, coherent, concise, and nonrepetitious" are rejected. Everything else is subject to editing.

The result is an extremely witty virtual magazine with a simple message: Blind devotion to computer technology translates directly into risks to our daily lives. What constitutes a risk? For starters, there's public safety, such as our faith that a big enough CPU can keep high-speed trains from smacking headfirst into one another or land a jumbo jet without human intervention.

If you prefer to attach a dollar value to your hazards, take your pick of economic risks. Like automated price-scanning systems, which routinely err in the grocer's favor as surely as a piece of buttered toast will hit the ground business-side down. Or automated securities-trading programs like the one that ruined the day for several thousand capitalists (and one unlucky squirrel) earlier this year.

The most frightening risk of all is the full-court press on privacy that computers make not just possible but inevitable. The Clipper Chip is the most heavily hyped risk to privacy, but the Risks Digest is full of chilling, matter-of-fact accounts of everyday assaults on our private lives that involve nothing more complicated than a database manager and an out-of-control bureaucracy.

How would you like it, for example, if you and your spouse were mistakenly listed as child abusers in a state-run database? That happened to a couple in suburban Washington, D.C., after a doctor mistakenly diagnosed their infant's rare bone infection as a fractured arm. The state acknowledges that the database entry is in error, but refuses to correct it. An appeals court upheld the state's decision, holding that there is no constitutional right to have records of an investigation destroyed. Meanwhile, the damning (and completely untrue) allegations have a digital life of their own.

Blind devotion to **COMPUTERS** *translates directly into* **RISKS** *to our daily lives. . . . One database* **WRONGLY LABELED** *a Virginia couple as* **CHILD ABUSERS.**

A Good Read More than anything else, though, the Risks Digest is a good read. I look forward to seeing it plop in my electronic mailbox two or three times a week. If you missed the Risks Digest in the last six months, you missed some pretty good stories, like the following e-mail message one correspondent received last summer: "One of IBM's electronic mail distribution nodes [recently] experienced a problem routing mail. . . . This may have resulted in your having received proprietary information that was not intended for you. If you have received such information, please return it to the Internet address: xxx@xxx.ibm.com without retaining any copies of it. If you have already destroyed or discarded the information, please confirm this by sending a note to this address stating that the information you received has been destroyed."

Kafka would have been proud. And I now think twice about trusting *anything* to e-mail.

Yes, there are unique risks to us all as a result of the widespread and sometimes unquestioned adoption of computer technology. You can stay in touch by reading the Risks Digest (look for the Usenet newsgroup comps.risk) or Peter G. Neumann's just-published compilation of material from the same source, *Computer-Related Risks* (ACM Press and Addison-Wesley, 1994). If you do, you just might discover two surprising facts. Internet newsgroups really can be literate and tasteful. And anyone who takes computer technology for granted is living in a fantasy world.

PHOTOGRAPH BY JAMES McCOON

The ZEOS® Pantera™...
"This Is As Good As It Gets."
–*PC World* Best Buy, August 1994

It's true! The ZEOS Pantera is as good as it gets. Leading experts from top industry publications all agree that the ZEOS Pantera is the best PC available. Unparalleled in its field, the Pantera has continuously earned award after award—month after month.

There's no desktop system that comes close to the ZEOS Pantera in performance, reliability, and value. As *PC/Computing* said: "Rocket-fast performance and a great price make this our favorite Pentium of the lot."

"Mark a new high on the performance chart!" *PC World* said the Pentium-66 and Pentium-90 Pantera PCs were "the fastest system(s) ever tested."

The ZEOS Pantera 66MHz and 90MHz also received the highest scores in all benchmark tests run by *Windows Sources*. "The ZEOS Pantera rose above the crowd and posted the most impressive performance numbers."

What makes the Pantera blow all others away—time after time? We start with a ZEOS designed motherboard, one that is created specifically to take full advantage of the latest technological advancements. The motherboard is stocked with exceptional features such as an on-board PCI Local Bus IDE Controller supporting up to four IDE devices. We also add a 64-bit PCI video card *standard* for the fastest video performance available.

intel inside

Supreme Power & Performance

The ZEOS Pantera, based on Intel's 486 and Pentium processors, is breaking record after record with its supreme power and awesome performance.

Valuable Extras

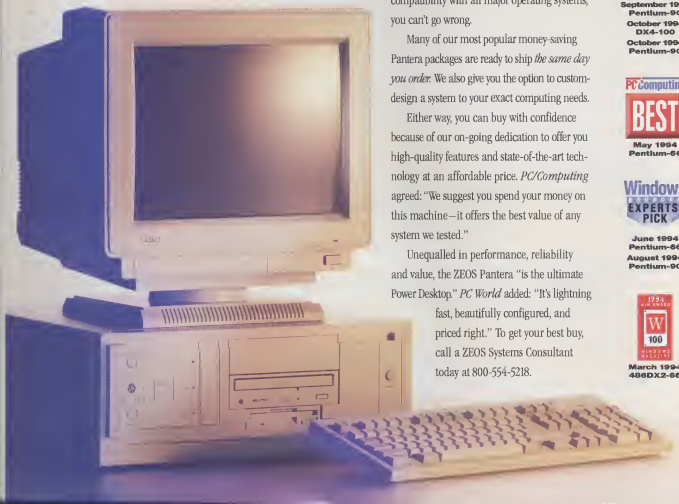
yes It runs with NetWare

The Pantera is a first-rate example of ZEOS' commitment to provide you with an excellent value on an award-winning machine that will increase your productivity. With all the extras, options, and 100% compatibility with all major operating systems, you can't go wrong.

Many of our most popular money-saving Pantera packages are ready to ship *the same day you order*. We also give you the option to custom-design a system to your exact computing needs.

Either way, you can buy with confidence because of our on-going dedication to offer you high-quality features and state-of-the-art technology at an affordable price. *PC/Computing* agreed: "We suggest you spend your money on this machine—it offers the best value of any system we tested."

Unequalled in performance, reliability and value, the ZEOS Pantera "is the ultimate Power Desktop." *PC World* added: "It's lightning fast, beautifully configured, and priced right." To get your best buy, call a ZEOS Systems Consultant today at 800-554-5218.



PC Magazine EDITORS' CHOICE
April 12, 1994 Pentium-66
June 28, 1994 DX4-100

COMPUTER SHOPPER
April 1994 Pentium-60
August 1994 Pentium-90

PC WORLD
January 1994 486DX2-66
February 1994 486DX2-66
March 1994 486DX2-66
June 1994 486DX2-66
June 1994 Pentium-66
July 1994 Pentium-66
August 1994 Pentium-66
August 1994 Pentium-90
September 1994 Pentium-66
September 1994 Pentium-90
October 1994 DX4-100
October 1994 Pentium-90

PC Computing BEST
May 1994 Pentium-66

Windows EXPERTS' PICK
June 1994 Pentium-66
August 1994 Pentium-90

1994 CHOICE 100
March 1994 486DX2-66

Processors	Package 1		Package 2		Package 3		Package 4	
486SX-33	$1445	Lease $61/mo.	$1745	Lease $64/mo.	$2245	Lease $82/mo.	$2745	Lease $100/mo.
486DX-33	$1545	Lease $57/mo.	$1845	Lease $68/mo.	$2345	Lease $86/mo.	$2845	Lease $104/mo.
486DX2-50	$1545	Lease $57/mo.	$1845	Lease $68/mo.	$2345	Lease $86/mo.	$2845	Lease $104/mo.
486DX2-66	$1595	Lease $58/mo.	$1895	Lease $69/mo.	$2395	Lease $88/mo.	$2895	Lease $106/mo.
Pentium-60	$1945	Lease $71/mo.	$2245	Lease $82/mo.	$2745	Lease $100/mo.	$3245	Lease $108/mo.
Pentium-66	$2095	Lease $77/mo.	$2395	Lease $88/mo.	$2895	Lease $106/mo.	$3395	Lease $113/mo.
Pentium-90	$2195	Lease $80/mo.	$2495	Lease $91/mo.	$2995	Lease $110/mo.	$3495	Lease $116/mo.
Standard With Every ZEOS Pantera System:	➤ 4MB RAM ➤ 214MB local bus IDE hard drive with 32K cache ➤ 3.5" 1.44MB floppy disk drive ➤ **64-bit** Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM ➤ ZEOS 14" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch ➤ Six-bay desktop case with two cooling fans ➤ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse		➤ 8MB RAM ➤ 528MB local bus IDE hard drive with 256K cache ➤ 2X CD-ROM drive, 3.5" 1.44MB floppy drive ➤ **64-bit** Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM ➤ ZEOS 14" 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch ➤ Six-bay desktop case with two cooling fans ➤ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse		➤ 16MB RAM ➤ 720MB local bus IDE hard drive with 128K cache ➤ 2X CD-ROM drive, 3.5" 1.44MB floppy drive ➤ **64-bit** Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM ➤ **ZEOS 15"** 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch ➤ Six-bay desktop case with two cooling fans ➤ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse ➤ Choice of Lotus Windows application		➤ 24MB RAM ➤ 1GB local bus IDE hard drive with 256K cache ➤ 2X CD-ROM drive, 3.5" 1.44MB floppy drive ➤ **64-bit** Windows-accelerated PCI local bus SVGA color graphics card with 1MB RAM ➤ **ZEOS 15"** 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch ➤ Six-bay desktop case with two cooling fans ➤ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse ➤ Choice of Lotus Windows application	

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If you like to travel light, the Meridian 400C, at under four pounds, is your ideal traveling companion and ultimate subnotebook.

The 400C features a 7.8" diagonal, STN color, backlit screen (active matrix 7.8" screen and monochrome backlit 8.2" display are also available); and two Type II PCMCIA slots. Packages 2 and 3 also include an external ultra-light (9 oz.) 3.5" 1.44MB floppy drive.

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At under 6 pounds, the Meridian 800C is light enough to travel anywhere yet it's large enough to use for presentations and regular desktop computing. You get the best of both worlds!

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- EPA Energy Star compliant.
- FCC Certified Class B; UL Listed.
- ZEOS Customer Satisfaction package.

Processors	Package 1		Package 2		Package 3	
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486DX2-50	$2195 Lease $80/mo.	$2495 Lease $91/mo	$2495 Lease $91/mo.	$2695 Lease $99/mo.	$2795 Lease $102/mo.	$2995 Lease $110/mo.
DX4-100	$2495 Lease $91/mo.	$2795 Lease $102/mo.	$2795 Lease $102/mo.	$2995 Lease $110/mo.	$3095 Lease $105/mo.	$3295 Lease $110/mo.
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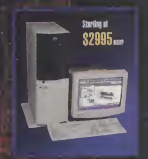
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As its name suggests, the new ALR Revolution Q-SMP™ is nothing short of revolutionary. Even in its base configuration, this system towers over the competition in both performance and value. By combining fast 90- and 100-MHz Pentium processors with 256-KB of level two write-back cache and our own performance boosting interleaved memory architecture, the Revolution Q-SMP easily clocks over **110 VAX MIPS**.

But that type of power is nothing compared to this system's ultimate potential. Thanks to its unique ALR Q-SMP modular architecture, the Revolution Q-SMP can accommodate up to **four** 90- or 100-MHz Pentium processors. It would take a small room full of 66-MHz i486DX2™ systems to equal this type of symmetrical multiprocessing power! More importantly, the Revolution Q-SMP complies with the newly issued Intel® MP Spec v 1.1™ multiprocessing standard, making it compatible with soon to be released "off-the-shelf" multiprocessing versions of the most popular multiuser/network operating systems.

Matching this seemingly boundless processing power is a cavernous double-wide chassis with room for over 14-GB of fully accessible disk storage (over 22-GB with soon-to-be available 2-GB drives). Add 10 EISA expansion slots, three VESA VL local bus extensions, room for up to 1-GB of EDC (Error Detection & Correction) RAM, and our industry leading 5 year/15 month warranty with the first year of on-site service for free*, and you have a server that's nearly impossible to outgrow.

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EISA/VL BUS	EISA BUS
MAX 1 GB RAM	512 MB RAM
EDC/ECC Memory	EDC/ECC Memory
13 Storage Bays	9 Storage Bays
10 Total Slots	7 Total Slots
715 WATTs Power	445 WATTs Power
$6495 MSRP (1 CPU)	$6582 ESP* (1 CPU)
$22,100 MSRP (4 CPUs)	$35,700 ESP* (4 CPUs)

$6495 MSRP (1 CPU) and $6582 ESP (1 CPU) represents base model price. $22,100 MSRP (4 CPUs) and $35,700 ESP (4 CPUs) represents a system configuration consisting of 64-MB RAM, 2-CD SCSI ARRAY (1 x 540-MB TEAC CD-Rom and Microsoft® Windows NT™). *ESP (estimated street price) quoted by authorized Compaq® reseller. VAX MIPS based on Dhrystone 2.1

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Circle 142 on reader service card.

John C. Dvorak



KEEP THE EDGE

The modern PC is adrift. Floating aimlessly. Going nowhere fast. In fact, look for the coup de grâce for the current generation of computers when manufacturers do what they do at the end of an era. They make a single-board machine that sells like hotcakes and is later perceived as a swan song. These machines should be avoided. Before and during the rollout of the PC, a slew of such machines was released, including the Altos and Morrow's MicroDecision. The latter was a dirt-cheap machine that had all the software bundled and did everything you wanted a machine to do—back then.

Before the dead-end of a computer genre is reached, we begin to see roadblocks to its improvements. There are a number of dead ends with the PC, led by video displays and video adapters. Everyone is buying 17-inch monitors, which at most can do 1,280-by-1,024-pixel resolution. Most users have peaked at 1,024 by 768, and the price of higher resolution is keeping them from moving ahead. Monitors 21 inches and larger, which go as high as 1,600 by 1,200, are the future. But they're too expensive for the typical user. There's no question that we'll all eventually be using 21-inchers (and maybe 26-inchers). But monitor makers will tell you that because of the technology involved, tubes this size are costly. Only a handful of companies can even make them: Hitachi, Mitsubishi, NEC, Panasonic, Philips, Sony, and Toshiba are the only ones I know of.

A 21-inch Standard? Only when the Taiwanese and Koreans get into the act do prices plummet. It will be years before the 21-incher becomes the standard monitor. That means a chip set on the motherboard capable of, say, 16 million colors at 1,280 by 1,024 should suffice, right? So there is one less option. One less thing to improve. One less slot needed.

The same holds for sound, which is being included on many motherboards. Whatever Compaq is putting on its motherboard could easily eliminate the need for a slot or an option. The great cards from Roland and Turtle Beach are better, but few people will need them. This brings us to the processor. I don't believe that at this point it's as important as the processor people would have you believe. When the PC overtook the CP/M machines, new, faster Z-80s (for the old platform) were being introduced that would triple the speed of the computer. Nobody cared because the power reached a point where it was more than adequate for the applications in use. Today, excluding users who do extensive power graphics with pricey power-hog programs such as Photoshop, most people don't need more power than they have. In fact, if Microsoft and Lotus and the rest would optimize their programs more often, the performance would be vastly improved. While a Pentium might double your performance, optimization may triple or quadruple it.

The **USER** *with the most* **POWERFUL** *up-to-date computer, with the* **BIGGEST** *screen and* **NEWEST** *software will always have the* **ADVANTAGE.**

The $499 Computer? With nowhere to go, the next step is the single-board, all-in-one computer that sells for less than $1,000 (with a decent monitor). In fact, we should see the mythical $499 computer that all the companies say will explode the market. It'll probably be limited to 640 by 480 with maybe 256 colors built in, a few ports, and bundled with Microsoft Office or some such compelling package. Users will flock to such a machine and it will define an era.

So why can't that era continue forever? We must remember that the driving force behind computers has always been to gain competitive advantage over the person sitting at the next desk. This is not accomplished when both people have the exact same equipment.

Don't Stagnate This is why true power users are linked up on powerful workstations. You can do what they do with a lesser machine, but not as well. When it comes to competition, the user with the most powerful up-to-date machine with the biggest screen and the newest software will always have an edge. When things are semistagnant, like they are today, you don't see this trend as clearly. It will emerge sometime in the next few years as money-conscious users (tightwads) fall behind those willing to invest in their future by moving forward with new technology.

Users must realize that, first and foremost, these computers are tools. When a new, better tool comes along, you should do whatever is necessary to upgrade. For example, I honestly believe everyone should be using 21-inch monitors because they give you an immediate competitive edge and you'll be buying one someday anyway. Might as well get it sooner than later when it is clearly advantageous.

This philosophy permeates computer magazines and is common among people like me who write about these machines. Many readers wonder why we don't boost add-ons to 286 computers or talk about how to maximize the PCjr they bought years ago. That's missing the point. And buying one of the upcoming $499 computers will be missing the point, too.

PHOTOGRAPH BY JAMES McCOON

Revolutionizing an industry happens once in a lifetime. Okay, maybe twice.



When the world asked for color, Canon responded with the revolutionary Color Laser Copier. Now Canon is answering today's color needs with a visionary new generation of color solutions, the Canon Color Laser Copier 800 and 700.

This new breed of copiers produces images so sharp, so vivid, they're virtually indistinguishable from the original. And Canon's new copiers are highly productive, too.

They make a swift seven full-color copies per minute on a variety of materials including card stock.

Circle 140 on reader service card.

Auto-feed OHP transparencies efficiently by cassette. Make multi-page documents effortlessly with the optional Recirculating Document Feeder and Sorter. And the Color Laser Copier 800 is the first color copier ever to offer *Auto Duplexing* for automatic two-sided copies.

You can also transform these new color copiers into ultrafast, full-color, plain paper printers with optional print controllers and Intelligent Processing Units (IPUs), so you can make brilliant color output directly from your computer or network.

For a free *Color Solutions Guide* that will tell you more about the new Canon Color Laser Copier 800 and 700, as well as the rest of our color copier line, call 1-800-OK-CANON. When the rest say you can't, Canon says you can.

N O W

Y O U

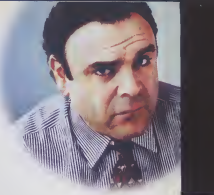
C A N

COME SEE US AT COMDEX BOOTH #1632

Canon

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Gil Schwartz



I ♥ My Platform

I bow to no man or woman in my regard for John C. Dvorak. When I was a tiny little zygote swimming in the early protean waters of 8088-based cyberspace, there was the monolithic Rock of Dvorak poking its huge mass above the seas of confusion. He kicked butt and mentioned names. He was fun. Even when he wandered off into the land of goo-goo Mac worship, he was still right there on the edge, showing us a good time.

Until now.

Now he's got me mad, thanks to this stupid, dangerous thing he wrote not long ago. Get this: In this magazine's older, more bourgeois brother publication, Dvorak has suggested that a platform shift away from Windows/Intel is not unthinkable. He mentions the fact that the CD replaced the vinyl record album almost overnight. He notes the slam-bam transition from CP/M to DOS in 1981. "Today there's pent-up demand for a new PC architecture," he writes, and goes on to lather, "The platform shift of 1981 is an act that can be repeated. Don't let them kid you into thinking otherwise."

Now hear this, folks. Hear it loud and clear. I am not about to change my platform. I don't want to. And it's not just that I can't afford to, because in truth I probably can. It's that, deep in my heart, I don't believe I should have to. As Nixon told Haldeman, it would be wrong. Basically, I feel the same way about people who suggest otherwise as I would about those who want to move my corporation to New Jersey, who want to take away my frequent flier miles and give them to the company for ethical reasons, who believe taverns should be smoke-free. I want to kill them.

Reasons? Sure, I've got some. But the bottom line is this: I work on this freaking machine, see? I make spreadsheets on it, and charts and reports, and I communicate with other electronic citizens. I make my living on it. Improve it, yes. Juice it up, certainly. Blow me completely off the planet, make me discard my entire universe so that a couple of high-end geeks with an infinite thirst for the squeakiest bell/whistle combination can ooh and ahh over the shock of the new? Bag it, dudes. Just get out of here and take your apologists with you.

How about some rational reasons:

1. I don't need it. I don't want it. It's too fast for me. I don't know about you, but I'm still reeling from the way my 50MHz 486 rips through the 18th level of Doom. I've got 850 True Type fonts on my system. About 80 applications. A dual-speed CD-ROM drive patched up to a SCSI card. After thousands of hours of cursing, praying, tinkering, ratcheting, tweaking—it all works! So don't tell me I can't use it anymore!

2. I'm still having fun at a price that makes me, not my reseller, happy. Have you noticed how amazingly cheap it is to get a 90MHz Pentium? And 1-gig hard drives are under $750! There are so many vendors that everybody loves you! Why in the world would we want to kiss off this entirely enthusiastic, competitive, responsive marketplace? These guys remind me of the people who said we'd all be using Unix by now. Why? Because it's better, you know. Elitism! Feh!

Are a bunch of new **BELLS AND WHISTLES** *enough to make me discard my* **ENTIRE UNIVERSE?** *Tempting, maybe. But as* **NIXON** *said to Haldeman, it would be wrong.*

3. The forces of darkness lie. Well, maybe that's a little harsh. They tell semitruths, like . . . the Power PC runs Windows, for instance. Does it? Does it really? Or does it run Windows only in . . . Standard Mode? Hah! That's like giving somebody a Porsche and then telling them they can only drive it in first gear. "Native applications!" they scream. Show me some! I am not a 3-D modeler! I reserve the right to be not interested—a right I couldn't exercise if you went and changed my platform, Sparky!

4. I don't want Big Brother (or Sister) to determine my future. I hate to have things done to me. I don't mind participating if invited, of course. But I hate the idea of troopers with big helmets and sticks coming into my house and yelling, "You will use Herculon furniture from now on!" Even if, you know, it's great furniture.

No, gang. The paradigm we should be investigating here is not the customer-hostile mutation of vinyl into CD. It's the changeover from leaded to unleaded fuel, which took a gradual process of decades to accomplish. It's high definition TV, which the Feds have decreed must take place in such a way as to make sure that nobody is forced to trade in a perfectly good old TV for a high-def new one they don't really want. It's the story of digital audio tape, which was greeted by consumers across the world with the message: "No more new formats! Stick it in your ear!" and sent back to Japan on the first boat out.

If you agree with me, vote with your voices, your modems, your feet. Open your windows (the real ones) and scream so that the world may hear: Evolution, yes! Revolution, no!

If you build it, we will not come!

PHOTOGRAPH BY JAMES McGOON



Funny how it's the little things that attract people to a particular small business server.

Then again, maybe this is a big thing.

Introducing the IBM PC Server, for small business.

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New! HP Color LaserJet, QMS magicolor, Xerox 4900 Color Laser

Color Laser Showdown

SNEAK PREVIEW

You would never dream of printing your most important black-and-white documents on anything but a laser printer. And in the future, you won't dream of printing your most important documents in black and white. Color gets noticed. But to get noticed with laser color, it will cost you more than $7,000.

Hewlett-Packard, the leader of lasers, has just released its $7,295 Color LaserJet printer. But just because it's color doesn't mean you should rush out and buy one. Like its competitors from QMS ($9,999) and Xerox ($8,495), it comes with several trade-offs.

We reviewed the Xerox 4900 Color Laser printer in September ("First Real Color Laser," page 61). This month, we compare it to QMS's new magicolor and HP's Color LaserJet.

Clearly Color The output from all three of these printers is impressive, though each has its strengths and weaknesses. If you need to print mostly text (both black and color text), the Color LaserJet is a good choice. Its black text is sharp, crisp, and very pleasing to the eye. Its color text, however, is somewhat dull and muted. The magicolor and the Xerox 4900, on the other hand, print colored text that's more vibrant. Of these two printers, the magicolor's color text is sharper and easier to read.

For photographs and other complicated images, the magicolor and the Xerox 4900 have an advantage over the Color LaserJet due to their higher resolutions—600-by-600 dpi for the magicolor and 1,200-by-300 dpi for the Xerox 4900. While the Color LaserJet's colors on complex images are impressive, its 300-dpi output results in a noticeable dithering pattern that detracts from the overall image. The Xerox 4900 has clean color output and higher resolution. The magicolor's colors were oversaturated compared to the Xerox 4900's, which caused some loss of detail.

For presentations with large blocks of saturated color, the Color LaserJet is the winner. It prints smooth background colors and strong oversized type. Similar presentations printed on both the magicolor and the Xerox 4900 appear blotchy and not quite as smooth.

The boon to color laser technology, in theory, is that you can print everyday text documents and add that splash of color to really make your point—be it a section of colored text, a financial graph, or even a photographic image. That's a pretty tall order for one printer, and we'll probably see a printer that does it soon, just not today. Between the Xerox 4900 and the Color LaserJet you can get that kind of quality, but you can't find it all in one box.

Speed Counts Color laser printers are lightning fast compared to other color printing technologies, and the Color LaserJet was the speediest of the three color lasers we tested. The magicolor and the Xerox 4900, on the other hand, performed similarly for graphics, although the magicolor was 17

OVERVIEW The Only Desktop Color Lasers





Big Business: Their output is impressive and so is their size. HP's Color LaserJet (left), Xerox's 4900 Color Laser (above left), and QMS's magicolor (above right) have breakthrough color technology and weigh over 100 pounds each. On top of that, each has a hefty price tag.



True Colors: The magicolor's oversaturation (left) makes colors hard to distinguish, while the Xerox 4900's images (middle) are somewhat blotchy. Despite its lower resolution, the Color LaserJet (right) produces smooth knockout presentation images.

PHOTOGRAPH BY ARNOLD HOSKINS

Color LaserJet

USABILITY: *Setup is a snap—you'll be printing in no time.* ★★★★

PERFORMANCE: *Prints even faster than the Xerox 4900.* ★★★★⅓

TECHNOLOGY: *Lower resolution than its competitors.* ★★★

VERDICT: *Good printer, great value.* ★★★★

magicolor

USABILITY: *Hardware setup is a breeze, software is tricky.* ★★★

PERFORMANCE: *Competitive with the Xerox 4900.* ★★★★

TECHNOLOGY: *True 600-dpi resolution.* ★★★★

VERDICT: *Impressive, but the most costly printer in the bunch.* ★★★

Xerox 4900

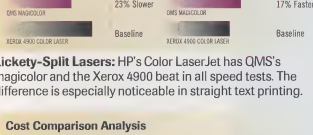
USABILITY: *Easy to set up and configure.* ★★★★

PERFORMANCE: *Prints at a rapid clip for color.* ★★★★

TECHNOLOGY: *Best combination of speed and quality.* ★★★★

VERDICT: *High-quality output at a midrange price.* ★★★★½

Accelerate All Your Printing



Lickety-Split Lasers: HP's Color LaserJet has QMS's magicolor and the Xerox 4900 beat in all speed tests. The difference is especially noticeable in straight text printing.

Cost Comparison Analysis

Output Device	50 Black Pages At 5% Coverage	50 Color Pages At 20% Coverage
HP Color LaserJet	$1.25	$5.75
QMS magicolor	$1.96	$14.04
Xerox 4900 Color Laser	$1.25	$8.00
Kinko's Copy Service	$3.50	$62.00

NOTE: VENDOR-SUPPLIED INFORMATION BASED ON PRINTER PAPER AND CONSUMABLES.

What's It Cost? Check out the prices you'll pay to print or reproduce a text document and a color document (20 percent of the page covered with 5 percent of each color).

percent faster at printing text.

While setting up a color laser printer is not hard, it's not as easy as setting up a black-and-white printer. Of the models reviewed here, the Color LaserJet has the fewest number of parts to install: There are only two developer cartridges (one for color and one for black and white), as opposed to the Xerox 4900 and the magicolor, which contain a separate developer cartridge for each of the four CMYK colors. Software driver installation is a snap with the Color LaserJet and the Xerox 4900, but the magicolor requires a little more technical savvy to get things going.

The Color LaserJet and the Xerox 4900 ship with impressive online guides. Both are full of useful information about the printer—everything from how to handle error messages to how to use color effectively in documents. There is no such offering with the magicolor.

When you consider list price alone, the Color LaserJet has the other printers beat. However, the base configurations of these printers are not equal. Included with the Xerox 4900 and the magicolor are PCL5 (PCL5C for the magicolor) and PostScript Level 2 compatibility. With the Color LaserJet, PostScript is an $799 option that brings its total cost to $8,094.

The other element to take into consideration is connectivity. To connect your Color LaserJet directly to a network, you'll need to spend at least $429 on an Ethernet and LocalTalk JetDirect interface card. QMS's CrownNet interface card costs $650 for Ethernet, and the Xerox 4900 costs $649 for its Ethernet option. (LocalTalk is built in to the QMS and Xerox printers.)

While the current offerings of color lasers have fair-to-excellent text quality coupled with good-looking color, their speeds are not fast enough to use for everyday network printing. And with color copiers still too expensive for most offices, quick reproduction of color output is impractical.

Your needs should dictate which pinter you purchase. If high-end color is what you're after, the Xerox 4900 is a safe bet. The magicolor is a strong competitor of the Xerox 4900, but it will cost you substantially more. And to liven up ordinary printing by adding splashes of color, the Color LaserJet will serve you well and save you up-front costs. KYLA K. CARLSON

FILEBOX

Color LaserJet

Resolution: 300 dpi.

RAM: 8MB standard, expandable to 56MB with PostScript or 72MB without PostScript.

$7,295 ($8,094 for PostScript)
Hewlett-Packard
(800) 752-0900
Reader Service No. 616

magicolor

Resolution: 600-by-600 dpi for black and white and 300-by-300 dpi for color with 12MB of RAM, 600-by-600 dpi for black and white and 600-by-600 dpi for color with 28MB of RAM.

RAM: 12MB standard, expandable to 64MB.

$9,999 ($10,999 for 600-dpi color capability)
QMS
(800) 523-2696, (205) 633-4300
Reader Service No. 617

Xerox 4900 Color Laser

Resolution: 300-by-300 dpi with the standard 8MB of RAM, 600-by-300 dpi with 12MB of RAM, 1,200-by-300 dpi with 20MB of RAM.

RAM: 12MB standard, expandable to 48MB.

$8,495 ($9,444 for 1,200-by-300-dpi capability)
Xerox
(800) 275-9376
Reader Service No. 618

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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Send e-mail to INFO@delphi.com

Circle 239 on reader service card.

Deskpro XL 566

Look Who's Talking—To You

USABILITY: *Unusual features make it easy to use and upgrade.* ★★★★★
PERFORMANCE: *Acceptable for its class, but there should be a P-90 option.* ★★★
TECHNOLOGY: *Integrated sound, video, Ethernet, and SCSI.* ★★★★
VERDICT: *A terrific business computer, but rather expensive.* ★★★★

Talking keyboards. The whole concept is enough to make us laugh. But Compaq's new Vocalyst keyboard is no toy—it's a serious addition to a machine designed for business computing.

By combining keyboard, mouse connector, microphone, and speakers in one unit, Compaq has cut the Gordian knot of cables and devices that tangle from the back of most sound-enabled PCs. And the Vocalyst keyboard is but one of the many shrewd innovations that make Compaq's new Deskpro XL 566 one of the best high-performance business machines money can buy. Leading-edge technology is another.

Speed Zone Not only does the Deskpro XL 566 represent Compaq's first implementation of PCI local bus, it integrates a local-bus Fast SCSI-2 controller and 32-bit Ethernet on the system board.

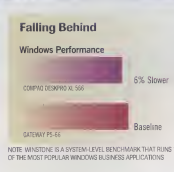
A 32-bit PCI version of Compaq's own QVision video accelerator comes standard, along with a VESA Advanced Feature Connector (VAFC). The Deskpro XL 566 will be able to take advantage of plug-and-play devices, and it features flash BIOS. There's even Enhanced Business Audio—Compaq's 16-bit DSP for annotating business documents with voice—built-in, hence the microphone in the keyboard.

Given all this peripheral power, we were surprised to find a 66MHz Pentium underneath the hood of the model we tested. With other manufacturers outfitting their flagship systems with 90MHz Pentiums or 100MHz DX4s, the Deskpro XL 566 seems underpowered.



PHOTOGRAPH BY ARNOLD TOSKEID

Thinking Ahead: The Deskpro XL 566 trailed a similarly configured Gateway machine in our real-world application tests—but not by enough to matter, given its forward-looking design.



Compaq promises a 100MHz DX4 and a 90MHz Pentium model before year's end.

All In One The value of the Deskpro XL 566, however, isn't barn-burning performance; it's usability. The case can be mounted under a monitor or sideways alongside a desk. (However, the clips that are supposed to hold the CD-ROM drive in place when the case is tilted to a tower orientation didn't work exactly as advertised.)

The microphone, positioned in the upper left corner of the keyboard, picked up speech clearly and precisely even when we were three feet away. Microphone and headphone jacks are built in, as is a volume control wheel. The speaker won't replace your Altec Lansings, but it beats the tinny blare of any internal PC speaker. The unit is even Energy Star compliant and features a pleasingly quiet fan.

Considering its price, we would not recommend this machine for a single user interested primarily in performance and features. But as an office standard, the Deskpro XL 566's integrated design and usability can add up to a great savings in time and headaches. And that adds up to a bargain in our book. **MARTY JEROME**

Hearing Things: The days of cable spaghetti on your desktop are numbered. The Deskpro XL 566 sports what appears to be a standard PC keyboard. But look at the upper right-hand corner of the keyboard for the built-in speaker, microphone, headphone jack, and volume control. The Deskpro XL is poised to take advantage of every technology lurking around the bend, from Windows 95 to videoconferencing.

FILEBOX

Compaq Deskpro XL 566

Competition: IBM's PS/2s, Dell's Optiplex line.

Configuration Tested: 66MHz Pentium, 16MB of RAM, 535MB hard drive, dual-speed CD-ROM drive, Vocalyst keyboard.

Processors: 60MHz Pentium, 50MHz or 66MHz 486DX2, 33MHz 486SX.

$4,099
Compaq Computer Corp.
(800) 345-1518
Reader Service No. 619

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

128-bit Graphics: More Better Bits

USABILITY: *The closest thing to plug and play in graphics.* ★★★★
PERFORMANCE: *Nothing touches it.* ★★★★★
TECHNOLOGY: *The first 128-bit graphics card—and the one to beat.* ★★★★★
VERDICT: *If you can afford it, get it.* ★★★★

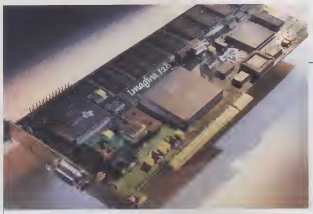
SNEAK PREVIEW

Just when we were convinced that 64-bit graphics accelerators were the best thing to plug your monitor into, Number Nine has upped the ante in high-performance boards with 128-bit graphics acceleration.

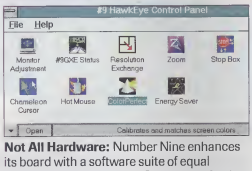
Built around the company's 128-bit chip, Number Nine's Imagine-128 is the first graphics card to rely on a 128-bit data path between the graphics card's controller and onboard graphics memory (most cards use a 32- or 64-bit path). The result? Even our preproduction model, with drivers not yet fine-tuned for Windows, dusted every other graphics card we've tested.

True Colors Speed isn't the Imagine-128's only virtue; it supports a wide range of color options and resolutions depending on the amount of video memory (VRAM) onboard. The 4MB model delivers 24-bit color at the two-page resolution of 1,152 by 864 pixels (ideal for desktop publishing), while the 8MB model hits 24-bit color at the very high resolution of 1,600 by 1,200 pixels (the resolution used in document imaging and specialized financial and design applications). Whichever mode you choose to work in, the Imagine-128 displays images that are mercifully flicker-free—it hits refresh rates of 72Hz and higher at all resolutions (assuming you have a monitor that can handle those resolutions).

Although the Imagine-128 is certainly a high-end board, that doesn't mean it's hard to use. Slip it into a PCI slot (sorry, no VL-Bus or ISA versions are planned yet), run the Windows install routine, and you're off to the races.

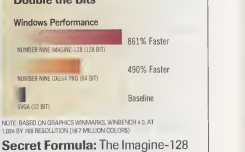


One Step Ahead: In the graphics-card game of performance leapfrog, Number Nine's Imagine-128 jumped ahead by a mile. The first 128-bit Windows accelerator for the PC, the PCI-only Imagine-128 is fastest, hands down.



Not All Hardware: Number Nine enhances its board with a software suite of equal strength. The high spots? Changing refresh and color levels without quitting Windows.

Double the Bits



Secret Formula: The Imagine-128 traffics graphics to its video memory across a 128-bit-wide data path.

Like all of Number Nine's graphics boards, the Imagine-128 includes a fine suite of HawkEye video utilities. A resolution exchange utility lets you quickly and painlessly select the resolution, color depth, and system font size you want the board to display under Windows. You can also select virtual resolutions of up to 2,048 by 2,048 pixels, and turn your monitor into a window on a larger virtual desktop that you can pan around with your mouse. This trick is a must for working on large spreadsheets or multiple documents at the same time.

Is It Overkill? This board clearly isn't for everyone—though any Windows user who gets frustrated by slow screen redraws will see the payoff immediately. Its wider data path gives it a 163 percent edge over typical 64-bit boards and over nine times the might of 32-bit cards. The wide data path also gives the Imagine-128 stamina: Its performance held steady even when displaying photographic-quality 24-bit images at what we previously regarded as ridiculously high resolutions.

Nevertheless, the board's steep $999 price tag is disproportionately high for a graphics adapter, which means that its earliest adopters are likely to be Windows users buried in high-resolution true-color desktop publishing, design, and illustration work. But if you want the biggest, baddest graphics card money can buy, look no further.

WENDY TAYLOR

FILEBOX

Imagine-128

Competitors: None (Matrox and ATI's best graphics cards are 64-bit).

Resolutions Supported: VGA; 800 by 600; 1,024 by 768; 1,152 by 864; 1,280 by 1,024; 1,600 by 1,200; and 2,048 by 2,048.

Maximum Colors and Resolutions: 16.7 million at 1,152 by 864 (4MB) or 1,600 by 1,200 (8MB).

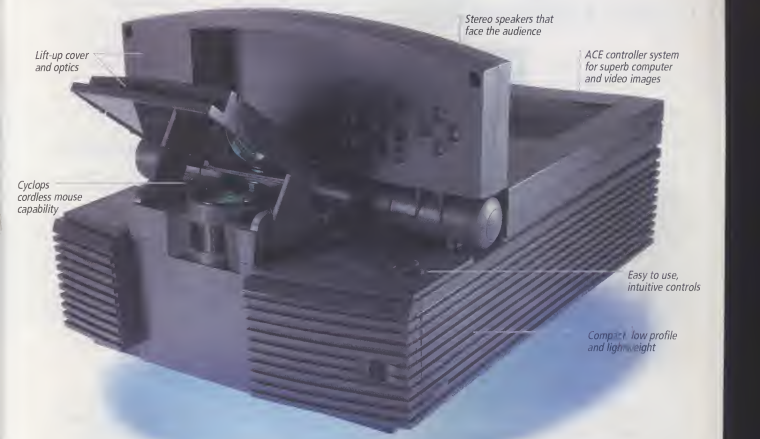
Drivers: Windows 3.1, NT, OS/2 2.1, X Windows; NeXTstep, AutoCAD.

$999 (4MB), $2,299 (8MB)
Number Nine Computer Corp.
(617) 674-0009
Reader Service No. 620

PHOTOGRAPH BY ARNOLD TSOE JO

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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And that saves you time and money.

MacUser MVP FINALIST

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Proxima's Desktop Projectors connect just like a monitor to any PC or Mac and work with your favorite productivity-enhancing software. Starting as low as $4,995, there's a model for almost any budget or application—from high-performance color to multimedia projection.



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Desktop Projector 2800 shown above.

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Circle 187 on reader service card.

World's Cheapest Receptionists

In a small office with a half-dozen people, you may not be able to afford a receptionist *and* a voice mail system *and* a fax machine. But just because your business is small doesn't mean it has to act small. New multimedia systems from Hewlett-Packard and AST pack a full suite of voice mail, fax, and data communications features into a single box, putting a corporate face on a storefront operation.

Phone Alone HP's Vectra VL2 4/50 and AST's Advantage Adventure 486DX2-50mt are general-purpose PCs that double as hyperactive answering machines, with data/fax modems that forward calls to voice mail boxes—5 boxes on the Vectra and up to 99 on the Advantage Adventure.

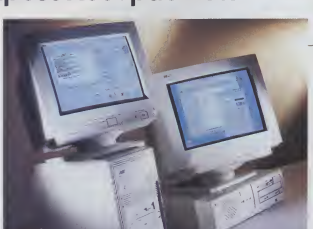
However, there's a major drawback in tying your PC to the phone system. As configured, these machines can't send a fax while receiving a phone call. Even if you were willing to shell out another $120 or so for a second internal 14.4Kbps modem and $50 to $100 for a second phone line, the software on these systems can't manage more than one modem at a time. If your office experiences even a moderate number of calls, you may as well write off the fax features.

The configurations of these systems vary from the sublime to the ridiculous. With the Vectra, HP includes Cardinal's DSP-based multifunction board for voice and data communications. The only drawback here is that you can't play sounds while you're receiving a message—not a huge problem for most offices. While AST does include separate sound and fax modem boards, its Sierra modem runs only at yesterday's bit rate of 2,400 baud. Simultaneous sound and data communication isn't worth that much of a performance hit. However, both systems do include a double-speed CD-ROM drive. (Not convinced that CD-ROMs mean business? Check out "Best CDs for the Job," page 156.)

Inside Out Look inside these systems, and the differences become even clearer. The Vectra's internal layout beats most systems we've seen. Its power supply swings up and out of the way to reveal easy-to-reach SIMMs and the CPU upgrade socket.

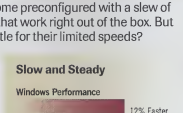
AST also makes a strong, if failed, effort to ease upgrading. The Western Digital hard drive resides on the swing-out door, so it's also easily accessible. The Achilles' heel of the Advantage Adventure's design are the dangling cables—clipped onto the chassis in peculiar places—that impede access to the slots.

While performance isn't a deal-breaking concern with these systems, we were surprised at how poorly they fared in our application benchmarks—only about 10 percent faster than a 33MHz 486. Still, with integrated voice mail and a CD-ROM drive for under $2,500, both machines make sense for the budget-conscious office. CHRIS SANDLUND



Function Overload? The Advantage Adventure (left) and Vectra (right) come preconfigured with a slew of multimedia options that work right out of the box. But are you willing to settle for their limited speeds?

50MHz DX2s Disappoint: These machines are more for the price conscious than the power hungry. They barely outran Compaq's 33MHz 486 Deskpro.



Vectra VL2 4/50

USABILITY: *Upgradable design is the best we've seen.* ★★★★★
PERFORMANCE: *HP invested in add-ons, not power.* ★★
TECHNOLOGY: *Good combination of fax, data, voice, and sound.* ★★★★
VERDICT: *No bargain, but full of the tools you need.* ★★★

Advantage Adventure

USABILITY: *It's a start, but niggling problems bother us.* ★★★
PERFORMANCE: *Slow CPU, slower modem.* ★★
TECHNOLOGY: *Well integrated, nice combination of features.* ★★★
VERDICT: *Cheaper than the Vectra, but the better price is a trade-off for inferior features.* ★★★

FILEBOX

Vectra VL2 4/50

Configuration Tested: 50MHz 486DX2, 8MB of RAM, 340MB hard drive, Cardinal multifunction board for voice and data communications, dual-speed NEC CD-ROM drive, 15-inch monitor.

$2,872
Hewlett-Packard
(800) 637-7740
Reader Service No. 621

Advantage Adventure 486DX2-50mt

Configuration Tested: 50MHz 486DX2, 8MB of RAM, 340MB hard drive, 16-bit sound card, data/fax modem, dual-speed Sony CD-ROM drive, 15-inch monitor.

$2,299
AST Research
(800) 876-4278
Reader Service No. 622

PHOTOGRAPH BY ARNOLD TROSLOT

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*



There are many ways to address letters.



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But there's only one smart way to do both.

Pocket your pen. Toss your typewriter. And leave your laser printer alone. Because if you're using any of them to address envelopes or make labels, you're making things hard on yourself. After all, you could be using a Smart Label Printer.

These little machines feature powerful, easy-to-use software. So you can print labels in an instant without exiting an application whether you're working with a Windows,™ DOS or Macintosh® system.

Smart Label software can automatically capture an address or other text and graphics from your computer screen. Print it instantly, or save it to the built-in database. It even lets you personalize labels with graphics, bar codes, digital images, and a selection of over 50 fonts. In short, this unique software makes Smart Label Printers the time-saving, hassle-free, fool-proof solution for labeling everything from envelopes to name tags, file folders to floppy disks.



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Seiko Instruments

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Circle 115 on reader service card.

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New! HARDWARE:
Remote Control, PowerControl, RemotePoint

Presenting Polite Ways to Point

You've got a great story to sell your clients, but the portable computer that you're running your presentation on makes a poor podium. You want to get up and move around, but you're leashed by that infernal mouse. What you need is a wireless pointing device that frees you from your chair.

We tested three wireless devices: Mind Path Technologies' Remote Control, SoftMagic's PowerControl, and Interlink Electronics' RemotePoint. All three use infrared technology and are easy to set up and use, and all can be used for presentation, training, and demonstration purposes. But of the three, only Remote Control combines ease of use with software that will add pizzazz and flair to any presentation. Remote Control is also the least expensive of the three.

Special Effects Remote Control is a snap to use. It features a large, circular button to control cursor movement and has five buttons with user-definable functions. Not only is the Mind Path hardware easy to use, but the software control panel is a model of simplicity despite the options it offers.

Speaking of options, here's a sample configuration: Assign one button to zoom in, one to zoom out, and another to turn on a mark-up layer. Our favorite function is Remote Control's "spotlight," which displays a movable circle of emphasis on your screen while the remainder of the screen dims. All told, there are 20 functions available with Mind Path's special-effects software.

For $149, Remote Control is the best value to liven up any presentation, training session, or demonstration.

PowerControl is also useful as a wireless pointing device, but it takes a slightly different approach than the other products. It ships with built-in macros for nine of the most popular presentation packages. For example, if you use Harvard Graphics, PowerControl has a preprogrammed button to display the next slide. If you use WordPerfect Presentations, there's a key to display the Go To dialog box. You can also create and edit your own keyboard or mouse macros.

PowerControl looks a lot like a typical television remote control. Unfortunately, cursor movement is limited to up, down, left, and right—diagonal movement across the screen is not possible, as it is on Remote Control and RemotePoint. Furthermore, there's no special-effects software, as there is with Remote Control.

This fall, SoftMagic is planning to release PowerControl 2.0, which will include F/X PowerTools (a special-effects program that has features similar to Mind Path's Presentation FX) and support for diagonal mouse movement.

RemotePoint is the simplest wireless mouse of the three. It has a pressure-sensitive disk to control the cursor (this technology offers more precision than the other two products) and two buttons to duplicate mouse functions. But that's all it has. There are no macros or special effects. On the plus side, RemotePoint has by far the coolest styling, and it's the most comfortable to hold. RemotePoint is a good choice if you're looking to simply cut your mouse's tail.

We're at That Point For wireless pointing and nothing more, RemotePoint is an adequate choice. However, if you use a presentation package daily, you will appreciate the versatility that PowerControl's built-in macros offer. And if you want to spice up your business-related presentations, training sessions, or demonstrations, you can't go wrong with Remote Control.

RICHARD SCHWERIN



High Points, Low Points: A wireless pointing device like Interlink's RemotePoint (left), Mind Path's Remote Control (center), or SoftMagic's PowerControl (right) can add pizzazz and pow to your next presentation.

PHOTOGRAPH BY ARNOLD TIDSEJO

Remote Control

USABILITY: *Simple controls and options.* ★★★★½
TECHNOLOGY: *Unique effects software.* ★★★★½
VERDICT: *All-around best solution.* ★★★★★

PowerControl

USABILITY: *Create and edit macros quickly.* ★★★
TECHNOLOGY: *No diagonal cursor movement in this release.* ★★
VERDICT: *No special-effects software.* ★★

RemotePoint

USABILITY: *Easy precision pointing.* ★★★★
TECHNOLOGY: *Standard infrared.* ★★★
VERDICT: *Good for wireless pointing, but no macros or special effects.* ★★★

FILEBOX

Remote Control

Number of Buttons: 8.
Range: 45 feet.
Technology: Infrared.

$149 (includes Presentation F/X software)
Mind Path Technologies
(800) 634-7424, (214) 233-9296
Reader Service No. 623

PowerControl

Number of Buttons: 23.
Range: 30 feet.
Technology: Infrared.

$195
SoftMagic Corp.
(617) 899-9966
Reader Service No. 624

RemotePoint

Number of Buttons: 3.
Range: 40 feet.
Technology: Infrared.

$179
Interlink Electronics
(805) 484-1331
Reader Service No. 625

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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IN BLACK AND WHITE.

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New! HARDWARE: Phillips CDD300

CD-ROM Drives Go IDE

USABILITY: *Doesn't get much easier than this.* ★★★★
PERFORMANCE: *Above-average double-speed drive, low CPU usage.* ★★★★
TECHNOLOGY: *Enhanced IDE technology flawlessly applied.* ★★★★
VERDICT: *Great price and easy installation make this a clear choice.* ★★★★

The quickest way to empty a room is to ask for help installing a CD-ROM drive. That's why we were surprised by the new Phillips CDD300. Slip this CD-ROM drive into a system with an enhanced IDE controller, attach the cables, and it works. And better yet, it works fast.

If this is what Enhanced IDE has to offer, we want it and so will you. With more and more systems shipping with built-in Enhanced IDE controllers, it's a natural upgrade technology. And the Phillips CDD300 is a great example for other manufacturers to follow. It's faster by a hair than one of the zippiest SCSI-based double-speed drives we've tested, Toshiba's XM3401B, and *much* better than hanging a CD-ROM drive off a sound card interface. And at low transfer speeds, the drive doesn't drag as heavily on the CPU, so your system speed won't suffer from accessing the CD-ROM until you hit fast transfer rates. Phillips even includes an interface card to upgrade your old IDE system.

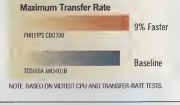
But this isn't a complete upgrade kit. If you don't have a sound-enabled system, you still won't after installing this drive.

The bottom line: At $199, the Phillips CDD300 is a simple, speedy, and very attractive bargain. **ADAM MEYERSON**



Fast IDE Recommended: If you have enhanced IDE, installing this double-speed CD-ROM drive is a plug-and-play operation.

Lighten the Load: On single-speed transfers, the CDD300 shoulders the load. But it drags on the CPU when it comes to fast transfer rates.



FILEBOX

Phillips CDD300

Specifications: Double-speed, MPC-2 compliant, ATAPI (Enhanced IDE) interface, 325ms access time, no caddy.

Front Panel: Headphone jack, volume control, tray open/close button.

Bundle: CD-ROM drive, ATAPI (Enhanced IDE) I/O card, cables, drivers for DOS and Windows 3.1.

$199
Phillips LMS
(800) 777-5674
Reader Service No. 626

Courier V.Everything

A Veritable Modem Smorgasbord

USABILITY: *Where are the LCDs?* ★★★★
PERFORMANCE: *Fastest all-inclusive modem we've seen.* ★★★★½
TECHNOLOGY: *Flash ROM upgradable.* ★★★★
VERDICT: *Modem compatibility champion.* ★★★★½

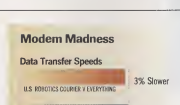
Modem standards got you confused? Can't tell V.34 from V.32 from V.fast Class? U.S. Robotics has a solution: the Courier V.Everything. Not only is it the first V.34 modem available, but instead of banking on a single proposed modem standard, the Courier V.Everything includes, well, everything: true V.34, V.fast Class, V.32 terbo, and V.32 bis.

Do you want fast faxes? The Courier V.Everything has V.17 compatibility for sending and receiving faxes at 14.4Kbps. And the upgradable Flash ROM makes it a snap to keep pace with changing standards.

Unfortunately, the front panel on this modem includes only cryptic LED lights. We prefer units with a communicative text-based LCD display (see "Line Quality," page 132).

But if you demand complete compatibility and strong performance in a modem, the Courier V.Everything is your best bet. **JOHN TASCHEK**

Photo Finish: The Courier V.Everything offers greater overall compatibility and competitive connect times on most of the current modem standards.



FILEBOX

Courier V.Everything

Protocols: V.34 Ready, V. fast Class, V.32 terbo, and V.32 bis.

$400
U.S. Robotics
(800) 342-5877, (708) 982-5001
Reader Service No. 627

PHOTOGRAPH BY ARNOLD TOSKUO

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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NOW AN EVEN BETTER VALUE.
Canvas now includes a CD-ROM tanked-up with over 10,000 premium clip art images and symbols covering just about every subject imaginable and 2,000 professional TrueType™ display, text and novelty fonts. Save time and effort by using our images as the starting point of your next project.

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Stop grinding your gears with old technology. Quit wasting valuable time and energy with outdated graphics tools. Dust off your leather jacket, put on your baddest shades, then visit your favorite Canvas reseller today. Or call 1-800-733-6322 to order, and hop on for the ride of your life. Helmet not included.

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WINDOWS Macintosh

Circle 175 on reader service card.

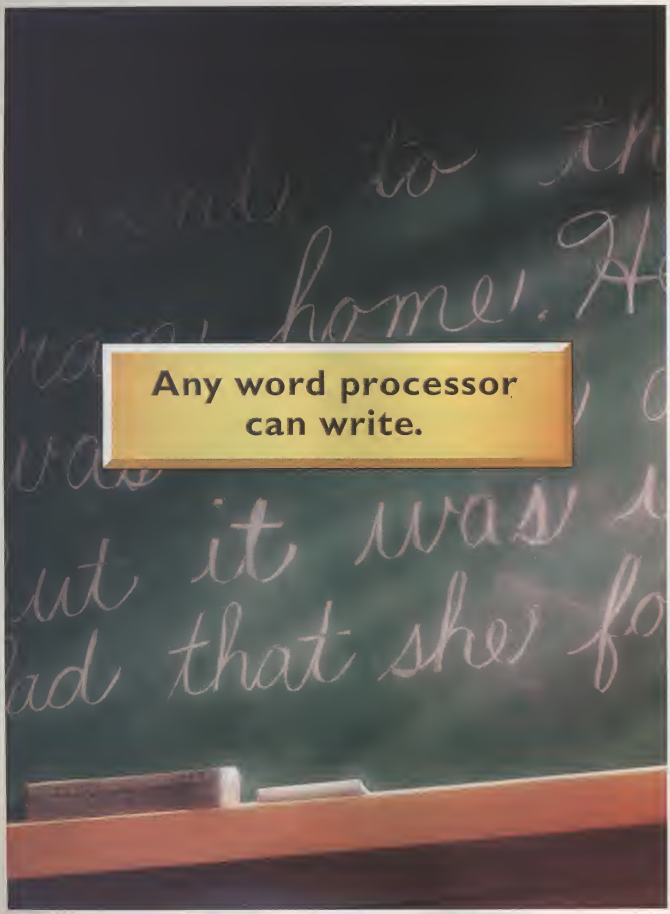
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$99.95 COMPETITIVE UPGRADE

Still using some other graphics program? Now we've made switching to Canvas even easier! Trade in that sooner for some real precision drawing power. Simply show your dealer proof of ownership of any Windows-based graphics program and shop nearly $300 off Canvas' already low $399 price!

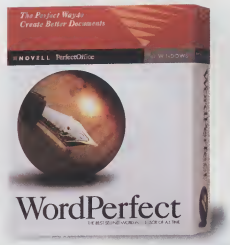


MONEY-BACK GUARANTEE 30 DAY



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New PerfectSense™ technology actually makes sense of your words. So it can do things LIKE REWRITE SENTENCES. Because new WordPerfect can read, it improves the way you write.



Most word processors are pretty simple. You type, it puts letters on a screen.

But now there's PerfectSense.™ An amazing new technology that allows WordPerfect® to make sense of what you write. In other words, it reads. Quite simply, it'll make you a better writer.

Take our exclusive new grammar checker—Grammatik® 6. It's the smartest and most useful ever. Instead of just offering grammar "advice," it can actually rewrite entire sentences for you. And because it understands your words and their context, it catches more mistakes.

Only WordPerfect can read.

It can rewriting your sentences for you.

Replace

It can rewrite your sentences for you.

What's more, PerfectSense lets you find and replace all the different "forms" of a word simultaneously. For instance, change "go," "goes" and "gone" to "fly," "flies" and "flown" at the touch of a button.

PerfectSense will even correct your most common spelling, spacing and typing errors as you type. So you don't have to take time to change "adn" to "and" or fix capitalization errors. LIke this.

PerfectFit with PerfectOffice

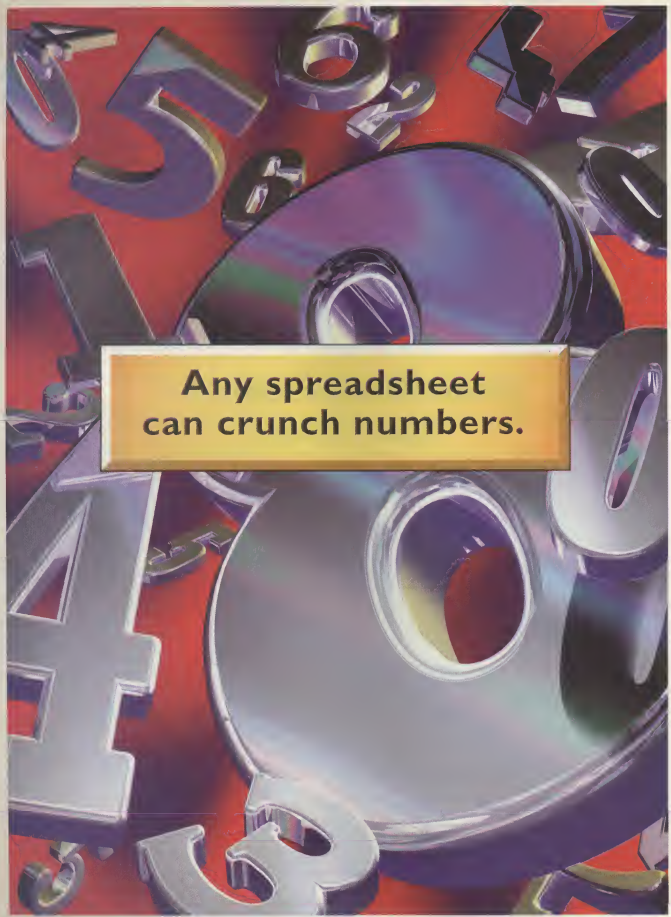
Remember, WordPerfect is also a very important part of our new PerfectOffice™ integrated suite of applications. And no one can convert your existing WordPerfect files and macros like we can.

So call 1-800-526-5163 for more information on the only word processor smart enough to write this ad. And read it.



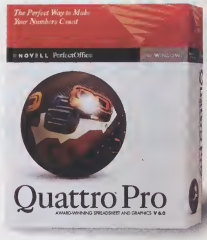
WordPerfect®

NOVELL.



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Introducing the all-new Quattro Pro. It's more of what you're looking for in a spreadsheet. Power. Ease of use. And GREAT-LOOKING NUMBERS.



Why simply crunch numbers? When you can graphically analyze, visualize and present them with all-new Quattro® Pro. It makes your numbers really shine.

We give you more ways to look at your data than either Lotus 1-2-3® or Microsoft® Excel. And Quattro Pro does most of the work for you. Intelligent Graphs automatically choose the best graph for your type of data. Graph Galleries format it beautifully. And Quattro Pro's revolutionary Presentation Advisor suggests the ideal presentation style.

Only Quattro Pro can polish them.

But Quattro Pro does more than make your numbers look great. It's the perfect combination of power and ease. Take our new Budget Expert, for example. It creates custom-tailored, fully formatted business and personal budgets in seconds. Try that in any other spreadsheet!

PerfectFit with PerfectOffice®

	Quattro Pro	Lotus 1-2-3	MS Excel
Automatic Experts	30	0	3
Graphics Advisors	YES	NO	NO
OLE 2.0	YES	NO	YES
Formula Composer	YES	NO	NO
Toll-Free Support*	YES	NO	NO

And our exclusive new Formula Composer makes creating formulas a breeze. We even have over 20 Analytical Experts that make analysis automatic. So you don't have to be a power user to use powerhouse tools.

Don't forget, new Quattro Pro is completely integrated with WordPerfect®. They look the same. And work the same. Just like all the products in our new PerfectOffice™ suite.

New Quattro Pro. It's powerful. Graphical. In a word—polished. To see how it makes your numbers look, call 1-800-526-2615 today.



Quattro® Pro

NOVELL

New! HARDWARE: Satellite T2400CT

Multimedia Launches into Orbit

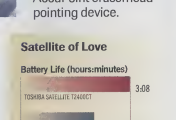
Looking for a portable multimedia machine but staggered by the cost—and weight—of the presentation powerhouses from the likes of IBM and Texas Instruments? An attractive alternative: Toshiba's new Satellite T2400CT. Under a beautiful 8.4-inch active-matrix color display, the Satellite T2400CT packs a powerful 486DX2/50 SL processor, a 320MB hard drive, and up to 24MB of RAM.

And you won't need a bulky port replicator or hefty multimedia brick to turn the Satellite T2400CT into a presentation machine—it's nothing if not expandable. It sports one Type 2 PCMCIA slot and a separate Type 3 slot, while most portables have two stacked Type 2 slots that double as a single Type 3. And you won't have to fill those slots with a sound card and SCSI adapter for your portable presentations: The Satellite T2400CT comes with a SCSI-2 port for a CD-ROM connection and offers a built-in Sound Blaster Pro–compatible board as an option. It's a little heavier than we're used to these days, but the multimedia extras make this an out-of-this-world deal. RICHARD SCHWERIN



We Get the Point: Toshiba ripped off its own Portégé family—by way of IBM's ThinkPad—for the Satellite T2400CT's AccuPoint eraserhead pointing device.

Hour of Power: The Satellite—which, unlike the Portégé, is powered by nickel-metal hydride batteries—ran almost an hour longer than its older cousin, the T4700.



USABILITY: *AccuPoint eraserhead finally goes mainstream.* ★★★★
PERFORMANCE: *Seven pounds is the price you pay for active-matrix color.* ★★★
TECHNOLOGY: *Multimedia expandability on the cheap.* ★★★★
VERDICT: *The affordable alternative for portable road shows.* ★★★★

FILEBOX

Satellite T2400CT

Configuration Tested: 486DX2/50, 320MB hard drive, 8MB of RAM, 8.4-inch active-matrix color display, NiMH battery.

Dimensions (in Inches): 11.7 (w) by 8.7 (d) by 2.2 (h).

Weight: 6.9 pounds.

$3,999 (as tested)
Toshiba America Information
(800) 334-3445, (310) 583-3000
Reader Service No. 628

LTE Elite 4/75CX

Kiss Your Power Brick Good-Bye

Faster, lighter, smarter, *now:* This mantra of mobile computing defines Compaq's new LTE Elite family of portable PCs. The results are subtle and welcome improvements over the older LTE series, as opposed to wholesale renovation.

The revolutionary feature of the LTE Elite is its integrated AC adapter, which means you'll never have to heave a power brick again. But the LTE Elite didn't need to be rebuilt from scratch. Retaining its time-tested keyboard, sparkling 9.5-inch active-matrix color display, and superb power-management utility, its traveling weight still tips the scales at under seven pounds (that includes the integrated adapter and fan).

The LTE Elite 4/75CX is plenty fast, thanks to its upgradable 75MHz DX4 CPU (look for a 100MHz model later this year). A removable 450MB hard drive is new (a 510MB drive is optional), and the standard 8MB of RAM is expandable to 24MB.

Usability is another matter. We applaud the LTE Elite's integrated AC adapter, but its right-mounted trackball is a relic from a bygone era. (Psst, Compaq. Check out Toshiba's T2400CT, above.) Our eyes also bulged at the price tag, but with the brick and a SCSI port built in, this system can easily double as a desktop machine. MARTY JEROME



Brick Housed: The integrated AC adapter on Compaq's LTE Elite is unique to high-end notebooks.

USABILITY: *No brick, but Compaq should rethink that trackball.* ★★★
PERFORMANCE: *Competes with the best.* ★★★★
TECHNOLOGY: *Upgradable CPU, built-in SCSI-2 adapter.* ★★★★★
VERDICT: *If you can live with the trackball, this is state-of-the-art mobile technology.* ★★★★

FILEBOX

LTE Elite 4/75CX

Configuration tested: 75MHz DX4, 8MB of RAM, 450MB hard drive.

$5,999
Compaq Computer Corp.
(800) 345-1518
Reader Service No. 629

PHOTOGRAPH BY ARNOLD TOSELI

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*



Barbara Stump
Network Administrator
Systech Environmental Corporation:

"In the decade or so since WordPerfect defined what customer support means to software users, we've come to depend on WordPerfect's customer support for quick, reliable answers.

"In fact, customer support is still one of the big reasons why WordPerfect, the Novell Applications Group, is different from other desktop applications companies. With over fourteen years of experience helping their customers, you could say they've learned a few things about finding solutions that improve customer productivity. And because WordPerfect has been committed to personalized customer support from day one, we know we'll continue to get the best customer support in the industry."



For a free brochure on WordPerfect's customer support options, call 800-526-4894

Discover what WordPerfect customer support can mean for you.

And now, as part of Novell, WordPerfect offers even more options to find the solutions you need. You still get the same personalized service you've come to expect in the past, but now you have access to the combined resources of Novell and WordPerfect.

To find out more about the industry's best customer support, call for our free brochure: **(800) 526-4894.**

"WordPerfect has always had the best customer support. And now it's getting even better."

BARBARA STUMP, SYSTECH ENVIRONMENTAL CORPORATION

WordPerfect®
Novell Applications Group

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New! HARDWARE:
ExecJet IIc

The Cheapest Color Money Can Buy

USABILITY: *Easy and quick setup.* ★★★★
TECHNOLOGY: *Holds up the low end of ink jets.* ★★★
PERFORMANCE: *Faster than its closest competitor, but output is unimpressive.* ★★
VERDICT: *The least expensive stand-alone no-frills ink-jet printer.* ★★★

SNEAK PREVIEW

Ink-jet printers are enticing. With price tags lower than most high-end applications, low-cost ink jets are practically an impulse purchase. Lexmark's ExecJet IIc (tested here in preproduction form) is the lowest-priced color ink jet on the market.

The ExecJet IIc features a swappable printhead design. If you're printing only black text, you use the black cartridge. For color, you switch to a three-color cartridge that makes an unimpressive composite black.

The ExecJet IIc's color output wasn't too impressive. The colors appeared faded, even when we chose the higher-quality presentation option in the driver. We also noticed some bleeding between black lines and surrounding colors.



Inexpensive Ink: Lexmark's ExecJet IIc is the least expensive ink jet out there. But for the low price, you get unimpressive color.

The black text output, while better in quality than the color output, definitely looked like it came from an ink-jet printer. The lines weren't crisp and the color wasn't as rich as output from a laser printer would be.

On the performance front, the ExecJet IIc was impressive. It averaged speeds that were 10 percent faster than Texas Instruments' microMarc Color.

If you're looking for a very low priced color ink-jet printer and can put up with so-so output at fairly quick speeds, the ExecJet IIc is right up your alley. But if you hanker for higher quality in your printouts, you're better off exploring more expensive options such as Hewlett Packard's DeskJet 560C or Epson's Stylus Color.

KYLA K. CARLSON

FILEBOX

ExecJet IIc

Competitors: HP DeskJet 500C, TI microMarc Color.

Resolution: 300-by-300 dpi for color, 600-by-300 dpi for black text.

Ink Cartridge Costs: $31.95 for black (more than 1,000 pages at 5 percent coverage), $37.95 for color (more than 200 pages at 15 percent coverage).

$349 to $369
Lexmark Int'l
(800) 358-5835
Reader Service No. 630

RollandRead Professional

Scan, Read, Recognize, Remember

USABILITY: *Easy to handle—but you have to install an interface card.* ★★★
TECHNOLOGY: *256 grayscale scanning, TWAIN and OLE compliant.* ★★
VERDICT: *Not cheap, not perfect, but delivers good desktop OCR.* ★★★

You say you need document management but can't justify the desk space? Recognita's RollandRead Professional, a TWAIN-compliant sheet-feed scanner, is less obtrusive than a phone-and-modem tag team and provides all that a small department needs to manage incoming paper.

Slide in an interface card, snap on the paper guides, and the RollandRead is ready to pump 6 pages per minute from its 10-page feeder. The RollandRead scans in up to 256 levels of gray, and its Recognita Plus 1.2 OCR software is a healthy performer that recognizes 80 languages—better than your average businessperson.

For tracking what you scan, the included document manager, Watermark 1.04, incorporates workgroup-oriented OLE technology.

Drawbacks? The graphics software, Photo Plus, is only for quick-and-dirty use. The OCR software doesn't handle multicolumn text formatting well, and it falters on narrow line spacing. And unlike the nearest competitor, Visioneer's $499 PaperMax, it requires you to insert an interface card.

The RollandRead costs $695, which is as much as a color flatbed scanner. But for a cramped desk with stacks of paper, it's a standout.

JAMES OLIVER CURY



Small and Fast: The RollandRead scans 6 pages per minute, and takes up less space than a box of Kleenex.

FILEBOX

RollandRead Professional

Competition: Visioneer PaperMax/MaxMate is easier to install.

System Requirements: 2MB of RAM, 3.5MB of free hard-disk space.

$695
Recognita Corp.
(800) 255-4627, (408) 241-5772
Reader Service No. 631

PHOTOGRAPH BY ARNOLD TOSKEID

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*


All He Does Anymore Is Tie Me Up In The Backyard...

ACCESS
LEVEL

You see... it's like this Doc... Gateway 2000® is man's new best friend. I used to think I was top dog. I was so much happier before his Gateway 2000 P5-90XL became a bone of contention between us. Walks, roughhousing — we even watched the late show together. Now his biggest passion is his Gateway P5-90XL. The cur.

It's not like I haven't tried. But, I guess I've been barking up the wrong tree, because no matter how much I try to impress him, his Gateway PC makes him happier and happier every day! And although I'm a mere canine, I know the Gateway P5-90XL is a powerhouse. I've heard about its phenomenal features, especially the Microsoft Office Professional applications — MS® Excel, Access® database, PowerPoint® presentation graphics program, Word and Bookshelf® '94. That's everything he needs even for his demanding work.

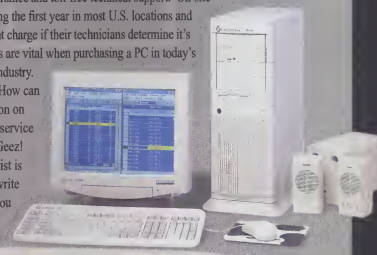
He's a veterinary scientist, so he loves to number crunch, create databases, write reports and integrate his findings into presentations. Sometimes I think he'll chase his tail when he talks about the power of the Intel® Pentium™ processor and how fast he calculates the cases of feline viral rhinotracheitis in purebred Siamese cats in the Pacific Northwest using Excel. Plus, the P5-90XL's 16MB of RAM and a whopping 1GB hard drive give him tons of room for his Access database on diseases afflicting short-haired cats in the twentieth century. (I say let the cats die!)

With his P5-90XL he can even run multiple applications simultaneously. He drools about the Object Linking and Embedding (OLE) feature that automatically updates information in an application after he changes it in a different program. And he pulls up feline anatomy images on his 17-inch CrystalScan® monitor in seconds with the lightning-fast speed of the ATI Mach 64 video card. This PC *is* perfect for him.

When he wants to relax he listens to his favorite music CDs on his Gateway PC. The Ensoniq® Soundscape wavetable sound card delivers unbeatable audio quality, and Altec Lansing ACS-31 speakers pump out great highs and heart-pounding bass.

He also goes on and on about Gateway's award-winning service and support and their friendly Midwestern employees. The company's three-year warranty on parts for desktop systems and Gateway monitors is incredible. That's 21 dog years! Gateway customers also get a 30-day money-back guarantee and toll-free technical support. On-site service is available during the first year in most U.S. locations and may be provided without charge if their technicians determine it's necessary. These factors are vital when purchasing a PC in today's dog-eat-dog computer industry.

What's that, Doc? How can you get more information on Gateway PCs and their service and support policies? Geez! Even my own psychiatrist is hounding me. Call or write them and they'll send you a free written copy of their warranty.



ENHANCED IDE

intel inside

pentium PROCESSOR

GATEWAY2000

"You've got a friend in the business."®

800-846-2062

Yes, Dr. Nine, the power of Gateway's Pentium™-based PCs has been unleashed! It's an epidemic that's spreading from one member of my family to another. Now *she* even has a Pentium-based system from Gateway. I can see why Dataquest,® Inc. reported that Gateway 2000® is the leading supplier of Pentium PCs in the nation — they're everywhere!

She's a freelance writer, and ever since she got her P5-90 Best Buy from Gateway 2000 all she does is rave about its amazing features that increase her productivity — like its 540MB hard drive, 8MB of RAM and a super-fast double-speed CD-ROM. I have to admit, she pumps out tons of work now, and it keeps her out of the doghouse because she never misses a deadline.

She especially digs Microsoft® Bookshelf® 1994 that's part of MS Office Professional. It makes research a snap! Bookshelf includes seven best-selling reference books including *The American Heritage Dictionary, The Original Roget's Thesaurus, The Columbia Dictionary of Quotations, The Concise Columbia Encyclopedia, Hammond Intermediate World Atlas, The People's Chronology, and The World Almanac® and Book of Facts 1994.*

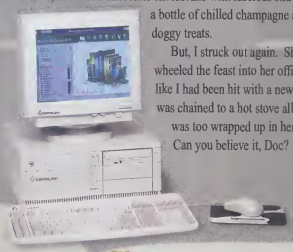
Of course, MS Word, the most popular word processor for Windows, has cool features like spelling and grammar check (she can spell check in 20 languages!), thesaurus and word count. She can even use Word and Bookshelf simultaneously!

Scheduling has never been easier with MS Schedule+ for Windows.™ It helps manage her time, and she can see her schedule at a glance. The PCI local bus graphics and 15-inch CrystanScan® monitor give her an incredible display. It's simply mesmerizing how much her Pentium-based PC has changed her life. Plus it was a great deal at $2,499!

I'm glad she loves her Gateway PC and all of its awesome software, but now *she's* ignoring me too! She's so engrossed with her P5-90 Best Buy she hardly stops to eat.

One day I prepared her a lunch fit for a queen. An elaborate feast really — Belgian endive salad, savory herbed croissants, wild rice pilaf, grilled apricot-ginger chicken breasts, and white chocolate cheesecake with luscious strawberry glaze. I threw in a bottle of chilled champagne and a few of my favorite doggy treats.

But, I struck out again. She didn't bat an eye when I wheeled the feast into her office. I was stunned — I felt like I had been hit with a newspaper! How could she? I was chained to a hot stove all day. But as usual, she was too wrapped up in her Gateway PC to notice me. Can you believe it, Doc?



GATEWAY2000

"You've got a friend in the business."®

8 0 0 - 8 4 6 - 2 0 6 2

intel inside

pentium PROCESSOR





Special thanks to the trainers, [illegible] and their many canine companions on this ad.
And a hearty thank you to "Shane," the golden retriever who portrayed our canine talent.

Doc! I have the solution. I'll get my paws on a Gateway 2000® PC too!

Why was I such a bonehead? Now I'll be part of the family again.

I'll get a 4DX2-66 Family PC™ — a doggone good value at only $1,899. The kids already have a P5-60 Family PC. I've seen how quickly they can finish their homework with the power of a Pentium-based system. They write reports in no time flat when they use Microsoft® Works'® word processor with spell check and thesaurus, along with unlimited resource information from MS Encarta 1994 Multimedia Encyclopedia. And, when they finish their homework early, they can explore the magic behind the movies with MS Cinemania '94, plus exciting software applications designed just for kids.

Now this new world of education and excitement can be mine too. I'll use Encarta to research my pedigree, and I'll plan for my retirement with MS Money™ — the kids have already formulated their college savings funds with this practical application.

I can even kick back and relax with the wonder of MS Multimedia Golf, and with the Family PC's high-quality sound cards and speakers, I can play music CDs, hear audio clips or record audio — all with stereo sound that delights even my sensitive ears.

I have so many exciting plans! I'll be a "Gateway Groupie" and communicate with other Gateway users on-line with my modem. (If I'm lucky I'll find a mate through an on-line dating service, and we'll have our own litter!)

That's it. I have to get my own Gateway Family PC. Gee, I wonder if they sell PCs to dogs? I know they accept most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. I can also apply for the Gateway 2000 DuoLine™ MasterCard® Card, issued by Dial National Bank, Des Moines, Iowa. Oh, and I'll be sure to ask about their "90 Days No Payment" Program!

Gateway 2000 customers in Canada and Puerto Rico receive toll-free telephone technical service in both countries (see the back page of this ad for special 800 numbers) along with award-winning technical support and CSA approvals. On-site service is available in some Canadian and Puerto Rican locations, and their international shipping rates are among the most competitive in the industry.

Thanks a lot Dr. Nine. You've been a big help. But I won't have time for my weekly appointment anymore — I'll be busy with my new Gateway 2000 Family PC!

Call Gateway 2000 today and get *your* paws on the best value in the PC industry!



Experience a fetching new world of education and excitement with a P5-60 Family PC!

Printed on recycled paper with soy inks

intel inside

Gateway 2000 is a corporate sponsor of

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GLOBAL RESCUE

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8 0 0 - 8 4 6 - 2 0 6 2

Gateway 2000 Family PCs™

4SX-33 FAMILY PC

- Intel® 33MHz 486SX CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Altec Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS® 6.22 & WFW 3.11
- MS Works,™ Encarta, Money,™ Cinemania '94, & Golf
- 3-Year Limited Parts Warranty

$1499

4DX2-66 FAMILY PC

- Intel 66MHz 486DX2 CPU*
- 8MB RAM
- 730MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Altec Speakers
- TelePath™ II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works, Encarta, Money, Cinemania '94, & Golf
- 3-Year Limited Parts Warranty

$1899

P5-60 FAMILY PC

- Intel 60MHz Pentium™ CPU*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Altec Speakers
- TelePath II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Color CrystalScan® Monitor
- Desktop Case
- AnyKey® Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works, Encarta, Money, Cinemania '94, & Golf
- 3-Year Limited Parts Warranty

$2499

P5-90 FAMILY PC

- Intel 90MHz Pentium CPU*
- 8MB RAM, 256KB Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Altec Speakers
- TelePath II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works, Encarta, Money, Cinemania '94, & Golf
- 3-Year Limited Parts Warranty

$2899

Professional Systems

4SX-33

- Intel 33MHz 486SX CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works 3.0 CD
- 3-Year Limited Parts Warranty

4SX-33 $1299

4DX2-66 $1599

(w/ 540MB Hard Drive & 8MB RAM)

P4D-66

- Intel 66MHz 486DX2 CPU*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$1999

P5-60

- Intel 60MHz Pentium CPU*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2299

P5-90 BEST BUY

- Intel 90MHz Pentium CPU*
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Color CrystalScan Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$2499

Portables

P5-90XL

- Intel 90MHz Pentium CPU*
- 16MB RAM, 256KB Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- ATI Mach 64 with 2MB VRAM
- Double-Speed CD-ROM
- 16-Bit Wavetable Sound Card & Altec ACS-31 Speakers
- 3.5" Diskette Drive
- 17" Color CrystalScan 1776LE
- Tower Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional CD
- 3-Year Limited Parts Warranty

$3699

HANDBOOK® 486

- 2.94 Lbs., 9.75" x 5.9" x 1.6"
- 80 to 250MB IDE Hard Drive
- External 3.5" Diskette Drive
- 7.9" Backlit VGA Display
- 2 NiMH Batteries & AC Pack
- Suspend/Resume Feature
- Leather Carrying Case
- MS-DOS 6.22, WFW 3.11 & Serial Transfer Cable

HANDBOOK 486SX-33
4MB RAM, 130MB Hard Drive, MS Works
$999 *(with 250MB HD $1499)*

HANDBOOK DX2-40
8MB RAM, 130MB Hard Drive, MS Works
$1499

HANDBOOK DX2-50
8MB RAM, 250MB Hard Drive, MS Office Professional
$2299

COLORBOOK™

- 5.7 Lbs., 11.7" x 8.5" x 1.77"
- 3.5" Diskette Drive and Removable 250MB or 340MB IDE Drive
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots (1 Type III)
- MS-DOS 6.22 & WFW 3.11

COLORBOOK 486SX-33
4MB RAM, 250MB HD, 9.4" LCD, 96/24Fax/Modem, Case, MS Works
$1999

COLORBOOK DX2-50
8MB RAM, 340MB HD, 10.4" LCD, 96/24Fax/Modem, Case, MS Office Professional
$3199

COLORBOOK DX4-75
8MB RAM, 340MB HD, 10.4" LCD, TelePath Fax/Modem, Case, MS Office Professional
$3699

Toll free from Canada 800-846-3609

Toll free from Puerto Rico 800-846-3613

GATEWAY2000

"You've got a friend in the business."®

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- MS DOS & Windows for Workgroups

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PCWEEK LABS ANALYST'S CHOICE

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- 15" Micron 15FGx, 1280NI
- MS Works Multimedia CD

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B
- 16MB RAM
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- MS-DOS & Windows for Workgroups
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- 3 LucasArts CD games: Rebel Assault Indiana Jones & Day of the Tentacle

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- MS-DOS & Windows for Workgroups
- MS Works Multimedia CD, Encarta CD
- Quicken CD Deluxe Edition
- On-line trial services: Compuserve, Prodigy and America On-Line
- 3 LucasArts CD games: Rebel Assault, Indiana Jones & Day of the Tentacle

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466 PCI MAGNUM

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- 2X CD-ROM drive, 3.5" floppy drive
- PCI graphics accelerator (1MB)
- 14" Micron 14FG, 1024NI, .28mm
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- Microsoft Mouse, 101-key keyboard
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- PCI graphics accelerator (1MB)
- 14" Micron 14FG, 1024NI, .28mm
- "Tool-Free" desktop or mini-tower
- Microsoft Mouse, 101-key keyboard
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- Microsoft Works Multimedia CD

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- Microsoft Office Pro 4.3 CD

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- Intel 60MHz Pentium processor
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- PCI graphics accelerator (1MB)
- 14" Micron 14FG, 1024NI, .28mm
- "Tool-Free" desktop or mini-tower
- Microsoft Mouse, 101-key keyboard
- MS-DOS & Windows for Workgroups
- Microsoft Works Multimedia CD

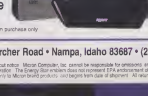
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PerfectOffice 3.0 vs. SmartSuite 3.0

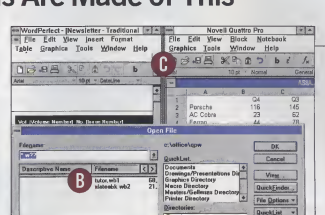
Suite Dreams Are Made of This

SNEAK PREVIEW

In desktop computing, there's no grail more holy than seamless integration—the transcendent state your computer achieves when it can solve any problem you throw at it without you even having to specify which application to use. This is the realm of software suites, and this realm's two newest entries—WordPerfect's PerfectOffice 3.0 and Lotus's SmartSuite 3.0—bring us closer to perfect integration than any collection of programs has before. Both products are real alternatives to the reigning champ of software suites, Microsoft Office.

Suite Ingredients The SmartSuite package includes Ami Pro 3.1, Approach 3.0, Lotus 1-2-3 Release 5, and Freelance Graphics 2.1, as well as the PIM Organizer 1.1 and a nifty screen-capture utility called ScreenCam 1.1.

PerfectOffice is available in a Standard Edition that includes the core applications WordPerfect 6.1, Quattro Pro 6.0, and Presentations 3.0, as well as the PIM InfoCentral 1.1 and workgroup applications GroupWise 4.1 (e-mail, group scheduling, and calendar) and Envoy 1.0 (for electronic distribution and group editing of documents). PerfectOffice Professional adds Borland's Paradox 5.0 for Windows and Novell's Visual AppBuilder 1.0, a boon to programmers. Finally, there's PerfectOffice Select, the first true build-your-own suite. This package lets you choose a combination of applications from WordPerfect and from affiliated companies that take advantage of the integration features in PerfectOffice.



Shared Success: Each of PerfectOffice's application menus, toolbars, and power bars takes advantage of similar icons, menu sequences, and dialog boxes.

A. PerfectOffice's **Desktop Application Director** (DAD) is available whenever you need it. And for convenience, you can position the DAD anywhere onscreen.

B. WordPerfect's **File Open dialog box** is available in other PerfectOffice applications. For example, this File Open dialog box is accessed through Quattro Pro.

C. The applications in PerfectOffice share many **common elements.** The top-level menus and icons in WordPerfect and Quattro Pro are nearly identical.

Come Together On the surface, SmartSuite captures the integration prize. Based on shared code that saves disk space and resources, its programs have a consistent look and feel in toolbars, menus, and status lines—it's easy to forget which one you're in. And the programs are integrated with Lotus Notes (sold separately) to automate group projects.

Navigating the suite is easy thanks to SmartCenter, an easily customizable floating toolbar that has icons for all the suite components, plus any other programs you add to it.

SmartSuite is a smooth combination that's easy to use because it works best at relatively simple tasks. But the whole is not greater than the sum of its parts, which a suite should be. You won't find a common macro language or receive any task-oriented help from SmartCenter.

Approach and 1-2-3 are the only SmartSuite applications that support OLE 2.0 (although 1-2-3 allows drag and drop only between itself and Approach). While limited, this capability offers you a different view of data from a 1-2-3 worksheet or Approach record.

Tying the Knot PerfectOffice comes closer to the ideal of suitedom, but its journey from the days when it was basically a grouping of applications from two companies (Borland and WordPerfect) in one box (Borland Office) has left it ragged at the edges. Unlike SmartSuite, its applications don't all have a consistent look and feel in their interfaces.

But where PerfectOffice lacks polish, it compensates with sheer power and functional integration. All of the members of the PerfectOffice Standard Edition share excellent common features, such as WordPerfect's powerful file management. Ease-of-use features such as QuickCorrect, which fixes spelling mistakes on the fly, and the intelligent search-and-replace introduced in WordPerfect 6.1 (see "More

PerfectOffice 3.0

USABILITY: *Good control center, inconsistent across applications.* ★★★

TECHNOLOGY: *OLE 2.0 support across all applications, DAD's QuickTasks make for easy-to-use application integration.* ★★★★½

VERDICT: *Currently the best all-around suite for integration, although one more round is needed to file the rough edges.* ★★★★½

SmartSuite 3.0

USABILITY: *Smooth and simple. Great application consistency makes it a snap to get the job done.* ★★★★

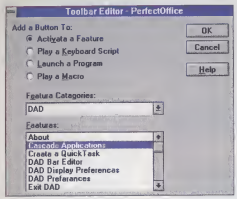
TECHNOLOGY: *Look and feel can't be beat, but behind-the-scenes integration of tasks and SmartCenter has serious shortcomings over the competition.* ★★★

VERDICT: *Great products, but the best integration (Notes) isn't available with the suite.* ★★★

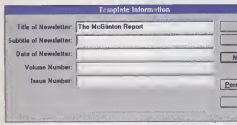
Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

New! SOFTWARE: PerfectOffice 3.0 vs. SmartSuite 3.0

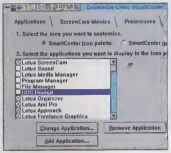
SIDE BY SIDE QUICK-AND-EASY AUTOMATION



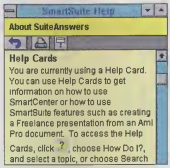
Rely on DAD: PerfectOffice's applications and several Program Manager tasks are controlled by the Desktop Application Director (DAD). You can customize DAD to launch programs, execute cross-platform macros—or QuickTasks—or perform any of several specialized features.



Quick and Easy: PerfectOffice's QuickTasks can span several applications to automate common tasks. QuickTasks prompt the user for information, then automatically assemble a document, presentation, spreadsheet, or report. You can also customize your own QuickTasks.



Suite Smarts: SmartCenter (top left) is SmartSuite's way of launching and switching applications—including ones that are not part of SmartSuite. You can customize it, but not as much as PerfectOffice's DAD.



Helping Out: SmartSuite has instructions in Help Cards for tasks that cross more than one application. But the instructions don't interact with live data and the user's actions.

FILEBOX

PerfectOffice 3.0

Competition: Microsoft Office 4.3, Lotus SmartSuite 3.0.

System Requirements: 386, 6MB to 8MB of RAM recommended, 84MB of hard-disk space for full installation of Standard Edition, Windows 3.1.

Noteworthy: OLE 2.0 support across all apps.

$659 for Standard, $299 upgrade; $859 for Professional, $359 upgrade
WordPerfect, The Novell Applications Group
(800) 321-4566, (801) 225-5000
Reader Service No. 636

SmartSuite 3.0

Competition: Microsoft Office 4.3, WordPerfect PerfectOffice 3.0.

System Requirements: 386, 4MB of RAM for any single app (6MB of RAM with 6MB swap file for two apps), 33MB of hard-disk space, Windows 3.1.

Noteworthy: Notes F/X support.

$595
Lotus Development Corp.
(800) 343-5414, (617) 577-8500
Reader Service No. 637

Features and You Might Get Hurt," page 90) can be used by any suite member as well as third-party products.

You can drag and drop information between tiled applications in PerfectOffice. Paradox and all of the standard components—except InfoCentral—are both OLE 2.0 clients and servers (InfoCentral is a client only). A common programming language, PerfectScript, automates operations across all of the standard applications, and users who don't feel completely at ease writing scripts can use an included cross-application macro recorder.

PerfectOffice's control center, the Desktop Application Director (DAD), includes features that SmartCenter and Microsoft's Office Manager lack. It can list and launch the last four files opened from each application. There's also an icon that launches Coaches for common tasks such as creating a mail-merge using the PIM and word processor. These Coaches guide you through the entire process—even to printing or e-mailing a document. In addition, you can use the macro recorder to automate common tasks.

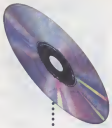
The Path to Rightness

Which suite is right for you? If you're already part of the huge 1-2-3 user base and have only moderate computing needs in other applications, SmartSuite is the sensible choice. It also makes sense if you need a good end-user database manager such as Approach or want integration with Notes, and it will work with older PCs that have 386 processors and limited RAM. But PerfectOffice has built-in networking features through GroupWise, and its word processor and database have more raw power.

On the other hand, Microsoft Office offers the advantage of OLE 2.0 support with Excel, WordPerfect, and PowerPoint, in addition to more consistency than PerfectOffice. But Microsoft's Office Manager, while miles ahead of SmartCenter, could stand to learn a bit from DAD. Neither product is quite the Holy Grail, but either would make a divine office coffee mug.

RON WHITE

Guide to the Ratings: ***** Excellent **** Good *** Acceptable ** Poor * Unacceptable



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Read the fine print on today's game boxes and you'll see the cautionary words *with compatible sound card.* That's because today's hottest games demand the PC sound standard—Sound Blaster.® Without it, you might get zip. No fantastic effects, no dramatic music, no true-to-life voices. Nothing.

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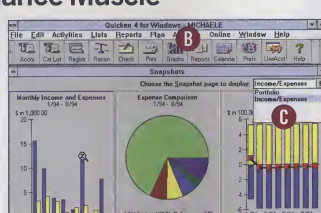
New! SOFTWARE: Quicken 4 for Windows

Flex Your Finance Muscle

USABILITY: *Superbly easy to use, smart HomeBase interface for beginners.* ★★★★★
TECHNOLOGY: *SnapShots and Super Categories are useful refinements.* ★★★
VERDICT: *Anyone can use this program, everyone needs this program.* ★★★★★

SNEAK PREVIEW

When Quicken first hit the market more than a decade ago, it resembled nothing so much as a Volkswagen Bug—a cheap and friendly little program that did a couple of things really, really well. Quicken has grown a lot since then; the newest version is the Cadillac of personal finance. Yet it's even easier to drive and gets much better mileage.



A. Enlarge yields a **full-screen view** of a chart, while successive clicks with the magnifying glass reveal the origins of the data point over which it is placed, down to the register level.

B. Get a quick read on your financial standing with any of 18 **preconfigured charts** or graphs.

C. Group up to six financial charts in one handy **analysis view.**

D. **Customize** chart type, order, contents, and more.

A Familiar HomeBase

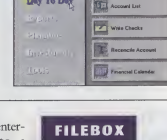
The easiest program to use is the one you already know. Despite a number of budgeting, planning, and data-entry enhancements, the interface of Quicken 4 for Windows (and the new DOS-based Quicken 8) will be comfortably familiar to all 6 million of Quicken's current users. New users are helped into the program in several new ways, the most significant being the optional HomeBase shell.

Click on one of the six activities on the left side of the HomeBase ledger and the appropriate menu choices scroll up on the right side (see detail screen). This early foray is eased by pop-up Q cards that offer specific instructions for each activity—and when you're tired of them, you can turn them off one by one. HomeBase is not as stylish as Managing Your Money, but it's just as usable.

Quicken groupies will be particularly happy that the new features don't require them to sacrifice old ways of working. They'll also appreciate the program's new conveniences. For example, you can now rearrange data fields in your registers to enter check numbers or amounts before dates, and a new scrollable ribbon of account names lets you jump to another account with just a click. It's easier than ever to schedule future transactions by dropping them on the Financial Calendar, and the Post-it–like notes you create there now appear in several other places, letting you use Quicken much as you would a PIM.

Financial Snapshots: Intuit's Quicken 4 for Windows gives you a complete picture of your financial situation, including tax planning, cash forecasting, budgeting, and savings goals.

Safe at HomeBase: If you think organizing your finances is too difficult, Quicken 4 will calm your fears. New users can get a structured path into Quicken by selecting one of six choices from the HomeBase interface from the Activities menu.



SnapShots of the Future

Quicken 4 also has new ways to help you find out where your finances stand today as well as where they're headed in the future. And the new SnapShots feature lets you set up quick views of your income, expenses, and investments to find just the information you need amid mounds of confusing data.

Similarly, new Super Categories help you cut through omnibus budgets to focus on your progress on certain discretionary items. You might group dining, travel, and entertainment categories into a Super Category called Discretionary Expenses to better track your spending against amounts budgeted. Tax planning is also easier now that the Quicken Tax Planner has been integrated into both of the new Quicken versions with improved links to Intuit's TurboTax. The luxo-cruiser edition of the program, called Quicken Deluxe 4, adds the Quicken Companion array of financial management and investment add-ins.

One of Your Best Values

Despite the new features, the new Quicken should sell for about $10 less than its predecessor. And Quicken's ease of use puts competing products from Microsoft and Computer Associates to shame. Quicken 4 is one of the best values in software.

MIKE HOGAN

FILEBOX

Quicken 4 for Windows

Competition: Microsoft Money, Meca's Managing Your Money, Teleware's M.Y.O.B.

System Requirements: 4MB of RAM, 7MB of disk space, 386, DOS 3.1 or later, Windows 3.1 or later, 9,600 baud modem (for online features).

New Features: SnapShots, Super Categories, integrated Tax Planner.

$39.99 floppy or CD-ROM (Windows only); Quicken Deluxe 4 for Windows $59.99 on floppy or CD-ROM; Upgrades are $29.99 to Quicken 4 or 8 and $49.99 to Quicken Deluxe 4
Intuit
(800) 624-8742, (415) 322-0573
Reader Service No. 638

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*





Armored warriors ride the wings of flying dragons. Trolls devise a surprise attack. To survive, you'll need to stay alert. And have a Sound Blaster sound card. In *Dragon Lore*, every nuance of battle comes

Between the roaring dragon and the screeching trolls, you can hardly hear yourself think.

to life with synchronized speech and sound effects. Bones crumble beneath your broadsword. A flailing mace rips through chainmail. And you hear it all with Sound Blaster. Just think of it as your most important weapon.

Sound BLASTER

Working together for sound compatibility.

MINDSCAPE
formerly
THE SOFTWARE TOOLWORKS

CREATIVE
MULTIMEDIA IS CREATIVE™

Circle 186 on reader service card.

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New! SOFTWARE: WordPerfect 6.1

USABILITY: *Just about as good as it gets.* ★★★½
TECHNOLOGY: *Intelligent search-and-replace, amazing formatting features.* ★★★★★
VERDICT: *An unparalleled combination of power and ease of use.* ★★★★★

More Features and You Might Get Hurt

SNEAK PREVIEW

For any business that produces large volumes of complex documents, there's no such thing as a minor upgrade to a word processor. Every improvement that lets users work in new ways can be a revolution—and every new bug a catastrophe. By those standards, WordPerfect 6.1 is a coup d'état over Microsoft's Word and Lotus's Ami Pro.

WordPerfect is always one step behind you as you write, sweeping up your little blunders. QuickCorrect—first seen in Word 6.0 as AutoCorrect, the feature that corrects frequent typos as soon as you make them—will now capitalize the first letter of a sentence, change two spaces to one, and give you more options for handling quotation marks.

Furthermore, you'll find a many improvements in WordPerfect 6.1 that probably you didn't think were possible. Take tables, for example. A Table Expert now lets you apply any of 40 predefined styles for appearance. Another new feature automatically changes the width of a column to fit the widest text in any of its cells.

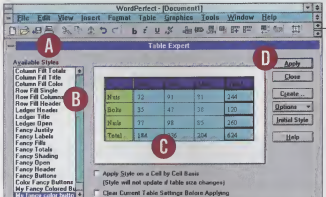
Work With Me With WordPerfect 6.1, working with documents has never been easier. QuickFormat, the feature that lets you apply the style of selected text to other text in your document, has been revamped to include AutoUpdate—if you make a formatting change, WordPerfect will automatically update all sections that share that formatting. And while the spelling checker and writing tools in WordPerfect 6.0 were never broken, WordPerfect fixed them anyway. The spelling checker, thesaurus, and find-and-replace capabilities now correct or replace entire word forms. For example, perform a find-and-replace on the word *fly*, and the program will catch *flew*, *flown*, and *flying*. Want to replace *fly* with *drive*? No problem. All forms will match the original version of the word, including *drove*, *driven*, and *driving*.

Fine Tuning WordPerfect has overcome some technical glitches that plagued earlier versions. For example, Version 6.1 supports up to 300 levels of undo. And drag-and-drop finally lets you move or copy text between two onscreen documents. You'll also find that WordPerfect 6.1 is OLE 2.0–compliant, making it cooperate nicely with other OLE 2.0–supported applications such as Excel or Quattro Pro 6.0.

Some annoying quirks are fixed, such as the inability of 6.0 to make Zoom to Margins the default display. And there are several other changes, including some designed to make WordPerfect consistent with other members of the new PerfectOffice (see "Suite Dreams Are Made of This," page 85).

So is WordPerfect 6.1 a flawless gem? No. WordPerfect still doesn't have the equivalent of AutoFormat, the automatic formatting feature found in Microsoft's Word. Some of the dialog boxes, particularly the one for spelling correction, could use some streamlining.

But is WordPerfect 6.1 a treasure? You bet. This version broadens those areas in which WordPerfect has led Word and closes the gap on nearly all of the Word features that WordPerfect lacked. **RON WHITE**



A. WordPerfect's **Table Expert** is a snap to use and it helps make your work look professional.

B. Choose from 40 predefined **styles,** which you can apply to your tables for an instant polished look.

C. Preview each style in this window before it's applied to your table so you know exactly what it looks like.

D. Smaller **toolbar buttons** keep your most-used icons available at your fingertips.

One of the Masses: In addition to a host of new features and enhancements, WordPerfect 6.1 has given tables formatting and calculating power that was once only possible in a spreadsheet.



Top Ten List: From within WordPerfect's Open File dialog box, there are a host of file management options. New to Version 6.1 is a drop-down list of your ten most recently accessed files.

FILEBOX

WordPerfect 6.1

Competitors: Microsoft's Word 6.0, Lotus's Ami Pro 3.1.

System Requirements: 6MB of RAM, 27MB hard disk for full installation (8MB to 10MB minimum), 386, Windows 3.1.

Features: Automatic spelling correction, smart speller, thesaurus, grammar checker, interactive templates, context-sensitive QuickMenus, industrial-strength macro language.

$495 (upgrade, $99; competitive upgrade, $129) WordPerfect, The Novell Applications Group (800) 321-4566, (801) 225-5000 *Reader Service No. 639*

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*





Destruction looms in the year 2027. Global terrorists threaten to capture a doomsday device in *Cyberia.* But you can stop them. Armed with your instincts and a Sound Blaster card, you experience every detail. Interact with synthetic 3-D

Ah, the crack and sizzle of another enemy ship turning to toast.

characters and move in a beautifully rendered world. Stunning sound effects and a full musical score make every action sequence breathtaking. Call it a truly original experience. And with Sound Blaster, it's unlike anything you've ever heard.

Sound BLASTER

Working together for sound compatibility.

Interplay

CREATIVE

MULTIMEDIA IS CREATIVE

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Circle 176 on reader service card.

New! SOFTWARE: Harvard Graphics 3.0 for Windows

Need Graphics Advice? Ask Harvard

USABILITY: *Great design advice.* ★★★★
TECHNOLOGY: *Powerful charting features, better presentation tools.* ★★★★
VERDICT: *More usable than before, but not as slick as PowerPoint.* ★★★

Since most of the people who do presentations are neither professional speakers nor graphic artists, the key to a successful presentation graphics program is an interface that will prevent you from making a fool of yourself.

Harvard Graphics 3.0 for Windows does just that. In addition to a straightforward interface and prebuilt templates, it gives you a personal online electronic design advisor. While it still isn't as elegant or cleanly designed as Microsoft's PowerPoint or Lotus's Freelance Graphics for Windows, this latest version goes a long way toward making this presentation powerhouse simple to use.

One of the finest new touches you'll notice in Harvard Graphics 3.0 is a Quick Presentations option that offers seven predesigned templates for a variety of presentations, such as a company profile or a business plan for business partners. These templates focus on content as well as design by suggesting an organization for your presentation and including customizable text in slides.

Just Like a Pro Harvard Graphics' Advisor system has been greatly expanded and integrated throughout the product to offer design and presentation advice. Especially notable is the Check Design option that will automatically review your entire presentation, or a single slide, to see if it violates good design principles. While a handy touch, this design checker does not catch everything. For example, it recognized things such as too many bulleted items in a bullet chart and too many slices in a pie chart, but we designed an awful-looking bullet chart with clashing colors and fonts that sailed through the design filter.

The Advisor also offers advice such as what kind of output works best for which kind of presentation and what kind of chart you should use to present certain kinds of information effectively.

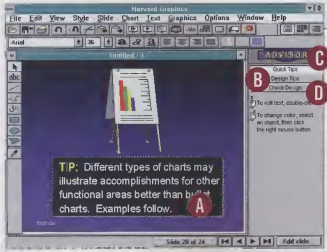
When you're tuning up a slide, the QuickLooks feature in Harvard Graphics will give you a thumbnail preview of what the slide looks like when any changes have been made.

The Little Things Harvard Graphics includes a host of minor enhancements, most of which focus on ease of use. Previewing transition effects has been improved. And dialog boxes and menu choices have been streamlined to alleviate potential confusion.

You'll find Harvard Graphics has improved its import and export capabilities as well, including support for Kodak Photo CDs and CorelDraw.

Harvard Graphics also has made strides in networking capabilities, offering support for VIM and MAPI mail protocols. You can easily send presentations via electronic mail now by simply clicking on an icon.

The focus of this new version is largely—almost exclusively—on streamlining the presentation process, and offering design and presentation advice. All in all, it's a success: Glitches like incomplete design advice aside, this program is much easier to use—although still not as easy to use as its competitors. **PRESTON GRALLA**



A. Quick Tips with information about creating or editing presentations are always within easy reach.

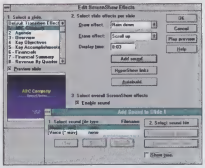
B. Harvard Graphics' **Design Tips** offer hints on creating the perfect slide for your information.

C. Focusing on ease of use, Harvard Graphics' **Advisor** has been more integrated into the program—it's now available in the Outliner and Slide Sorter views, as well as the Master Template, Backgrounds, and Slide Templates.

D. Notable is the **Design Checker**, which offers specific design advice on creating effective slides.

Purely Professional: In a hurry? Don't worry. Quick Presentations will write your outline for you and make sure your slides don't look like Pollock paintings. All sorts of handy tips will keep you on your toes.

Easy Excellence: For users who require the extra flair that multimedia offers, Harvard Graphics includes an Animation Player with 15 clips that make adding special effects and sound to screen shows a snap.



FILEBOX

Harvard Graphics 3.0 for Windows

Competition: Microsoft's PowerPoint 4.0, Lotus's Freelance Graphics 2.1.

System Requirements: 386 or better, 4MB of RAM, 9MB of hard-disk space (24MB for full installation), VGA or higher resolution, Windows 3.1.

Standout Features: Design and presentation advice, integrated e-mail.

$395
Software Publishing Corp.
(800) 234-2500
Reader Service No. 640

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*





Your clues are hidden in the whispers of floating apparitions. Eerie piano music could be a sign of danger. Warnings come to you through strange murmurs. So, if you want to unravel Old Man Stauf's bizarre secrets, keep your eyes peeled, your

One by one the guests arrive. Then the party really starts howling.

nerves steady, and your ears open. And take this hint—make sure you have a Sound Blaster sound card. Every bone-chilling shriek, hair-raising scream, and breathless gasp in *The 7th Guest*™ seems terrifyingly real when played on a Sound Blaster. Forget about getting out alive without one.

Sound BLASTER

Working together for sound compatibility.

Virgin INTERACTIVE entertainment

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CREATIVE
CREATIVE LABS, INC.
MULTIMEDIA IS CREATIVE™

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Circle 177 on reader service card.

New! SOFTWARE: LapLink 6.0 for Windows

The Remote Possibilities Are Endless

USABILITY: *Easiest file transfer ever.* ★★★★
TECHNOLOGY: *File sync, Clone, and remote-control in one.* ★★★★½
VERDICT: *If you use more than one computer, you need LapLink for Windows.* ★★★★

SNEAK PREVIEW

It's Saturday night. You're at home, working on that all-important proposal due Monday morning. Suddenly, you realize that the spreadsheet you need to generate a chart is on your hard disk at work. After a moment of panic, you realize that all is not lost. You have LapLink for Windows, and your office system is on with LapLink running there, too. (Aren't you smart for remembering all these details?) You dial in and download the file just in time to watch "Weekend Update."

With LapLink 6.0 for Windows—the first Windows release, reviewed here in beta form—Traveling Software takes its staple file-transfer utility to the next level: remote access and control. You can now run programs on a remote system as if you were sitting at its keyboard. During our testing, LapLink handled standard DOS programs running in a DOS window on the remote system—a task other remote-access applications have trouble with.

With its file transfer and remote access, LapLink competes not just with DOS's own file exchange function and transfer programs like Grand Junction Networks' FastLink and SoftWorx's Interlink, but also with products like Ocean Isle's ReachOut, Symantec's pcAnywhere, and Triton Technologies' CoSession.

Many Methods LapLink provides a number of methods for connecting two computers. In addition to the traditional serial or parallel cable connection (cables are included), you can connect systems over a modem or a NetWare network. The program also supports the AirShare wireless transmitter/receiver used in LapLink Wireless (it works over a range of about 30 feet).

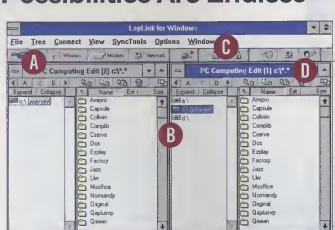
To copy files from place to place, you can choose the specific files you want transferred or use the SmartXchange or Clone options for speedy batch-style operation. SmartXchange updates a directory with the most recent version of files from the source system. Clone is the most efficient way of duplicating systems—say, when you create a "master" PC configuration and want to make a dozen machines just like it.

For managing your own files in a timely manner, a SpeedSync feature sends only those portions of a file that have changed since the last update. A similar SmartXchange lets you synchronize two computers' operations by ensuring that only the newest version of any file exists on each.

Versa-Utility Installing LapLink is a breeze. The Setup program analyzes your hardware and configures itself automatically. Just specify a directory in which it should store its files and assign a name to your computer. A remote install option lets you add LapLink to a second computer through a serial cable.

LapLink's file management utilities are so versatile that they can stand in for File Manager. And the bonus of remote control makes LapLink 6.0 for Windows a communications utility every multimachine user needs.

JACK NIMERSHEIM



A. LapLink includes modem and network support. You also can create a **wireless link** between two computers within a 30-foot range.

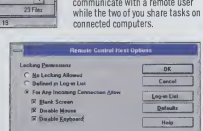
B. The **split-screen interface** on LapLink includes full file and directory tree displays.

C. The **Address Book** records information about the kind of connection, service, and security data for each remote computer.

D. A new **Chat** feature lets you communicate with a remote user while the two of you share tasks on connected computers.

On the Road: Need to access an important file on your hard drive but you're away from the office? LapLink 6.0 for Windows now offers remote control, so you can access desktop and network databases, e-mail, and other applications from just about anywhere.

Playing the Polite Host: LapLink's Remote Control feature includes security and access options. When accessing a remote computer from a laptop, for example, you can take exclusive control of the remote.



FILEBOX

LapLink 6.0 for Windows

System Requirements: 4MB of RAM, 6MB of hard-disk space, Windows 3.1, modem or serial port.

Competition: Grand Junction Networks' FastLink, Softworx's Interlink, Symantec's pcAnywhere, Triton's CoSession, and Ocean Isle's ReachOut.

Modem Support: V.Fast, cellular, and PCMCIA.

5140
Traveling Software
(800) 343-8080
Reader Service No. 641

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Do You Make These Six Common Mistakes On Your Taxes?

Six common mistakes can cause you big headaches on your taxes. An oversight here, an omission there. From unnecessary tax payments to full blown IRS audits—you can end up paying too much . . . or worse. But now, using TurboTax® or MacInTax®, you can avoid these simple but costly mistakes:

1 The Arithmetic Error
Today, even the simplest forms contain complex calculations. And with all the late-night scrambling, an innocent mistake could cost you plenty.

2 The Transcription Error
With all those numbers being juggled from schedule to schedule, it's no wonder the figures are so often transcribed incorrectly or entered on the wrong line.

3 The Omitted Form
Even "ordinary" returns require anywhere from six to a dozen forms to complete. It's easy to miss one or end up rushing all over town to find the one you need.

4 The Misinterpreted Instruction
At best, IRS instructions can be tough to understand. At worst they can be mind-boggling. What you need are clear directions in plain English.

5 The Overlooked Deduction
You'd have to be a professional tax preparer to know all the deductions you're entitled to. If you miss just one, it could cost you hundreds of dollars.

6 The Exceeded Guideline
The fastest way to trigger an IRS audit is to exceed the "normal" range on one of your deductions. You need to know what the IRS looks for on a line-by-line basis.

When you do your taxes with TurboTax, mistakes like these are virtually impossible. And filling your taxes couldn't be easier.

Now With TAX ADVICE

America's #1 Tax Software

The fastest, easiest way to do your taxes right. With a new Windows interface and enhanced capabilities for 1994, America's #1-selling tax software now makes preparing your income taxes easier than ever. Just gather your records and receipts, sit down at your computer and let TurboTax's award-winning EasyStep® tax preparation system guide you through every step of the way. Then print out your forms, sign them and drop them in the mail. It's that easy!

New "smart features" save time and ensure accuracy. Our TaxAdvisor™ points out overlooked deductions and mistakes on the fly—while you're entering your data into our Windows and Macintosh software—to improve the accuracy of your return. And the SmartAudit™ feature hunts down errors, omissions and likely audit items . . . and takes you directly to each item and tells you what to change and how. All in a fraction of the time you'd spend checking and revising your return manually.

Get more out of Quicken® with TurboTax. Our TaxLink innovation lets you work with TurboTax and Quicken—America's #1 personal finance software—as if they were a single program. Zoom in on tax-related Quicken transactions from within TurboTax—item by item—and reassign tax categories to maximize your tax savings. Then jump back to TurboTax and see the recalculated results. (Windows version only.)

TurboTax Quicken

Take our powerful CD-ROM for a spin. TurboTax on CD-ROM offers concise, full-motion video and audio assistance, plus over 60 IRS publications and expert tax advice from Marshall Loeb, former managing editor of Fortune magazine and tax attorney, Mary Sprouse, former IRS Audit Group manager, and author of the The Money Income Tax Handbook.

More returns filed and more awards won than any other tax software. Over 40 million returns have been filed using TurboTax, making it the nation's most trusted tax preparation program. So order today. And see for yourself why the new TurboTax is easily the best tax software ever!

Includes 2 Free Bonus Gifts!

Tetris. Rotate and flip moving pieces as they fall from the top of the screen. Fit the pieces precisely with others to form a complete row. The quicker you are, the higher your score!

Money Tax Strategies Book. Over 100 pages of money-saving tax strategies, from renowned tax authority Mary L. Sprouse and the experts at *Money* magazine.

☐ Yes, I'll try TurboTax FREE!

Intuit

Rush me my FREE gifts and FREE TRIAL copy of TurboTax as soon as they're available (usually late October). If I'm not 100% satisfied, I'll return TurboTax within 30 days and owe nothing. If I decide to keep it, my credit card won't be charged until after my 30-day Free Trial. Either way, my FREE gifts are mine to keep, whatever I decide.

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Address _____

City _____ State _____ Zip _____

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☐ 5-¼" disks ☐ Low Density

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☐ TurboTax for Windows™ $39.95
☐ TurboTax for Windows - CD ROM $39.95
☐ MacInTax (for Macintosh®) $39.95

Mail your order to: Intuit, 2650 E. Elvira Rd., #100, P.O. Box 28815, Tucson, AZ 85775-2612. Or Call NOW.

Bill My: ☐ Visa ☐ MasterCard ☐ Discover ☐ Amex
I understand that there is an additional $7.00 shipping per order.
Card # _____ Exp. Date _____
Signature _____

800-964-1040 ext. 42420

TurboTax requires IBM PC, XT, AT, PS/1, PS/2 or compatible; DOS 3.0 or higher; 640K RAM; hard drive. TurboTax for Windows requires Windows 3.1 or higher; 4 MB RAM; hard drive; CD-ROM version requirements are Windows 3.1 or higher, 256 color capable VGA monitor; double speed CD ROM drive; and sound card. MacInTax requires Macintosh Plus, System 6.0.5 or higher; hard drive. Office expires on 4/15/95; trial valid with any other offer. 30-Day Money-Back Guarantee excluding sales and Quicken are registered trademarks of Intuit. Other trademarks are the sole property of their respective owners. ®Residents of AZ, AR, CA, CT, FL, IL, MA, MI, MN, NJ, PA, TX, UT, VA. Void where not applicable sales tax. Please add $7.00 shipping and handling per book. For retail purchases, attach a copy of sales receipt and enclose $7.00 U.S. for shipping and handling. ©Time or money order payable to Intuit. Send to: Intuit Terms Offer 29262-F, Dixie Road, #109, P.O. Box 28615, Tucson, AZ 85775-2612. All prices are U.S. dollars. ©1993. Customer is responsible for return shipping charges.

New! SOFTWARE: SoftSolutions Suite 4.0

A Lending Library for Your Files

USABILITY: *Great for users, pity the installer.* ★★★
TECHNOLOGY: *Tight integration with networks and other apps.* ★★★★★
VERDICT *A must-have for networked offices that deal with large volumes of documents.* ★★★★

While we'd all like to attain the nirvana of the paperless office, DOS's eight-plus-three filename restriction makes it almost impossible to track documents, especially on a network. As a result, PC users have found ingenious ways to kludge around this problem, such as inventing file-naming systems that use different extensions or creating subdirectories to store various document types or multiple versions of the same document. Although these makeshift solutions are clever, they're far from ideal.

SoftSolutions Suite *is* ideal. This collection of Windows tools provides the kind of organization that will satisfy the most organizationally compulsive among us.

Looking Around SoftSolutions Suite tracks your files by creating document profiles for them. These are records of each file with fields for a descriptive name, the author's name, and the document type, as well as additional fields that you can customize.

To find a file, you use query by example, filling in fields with as many criteria as necessary to narrow the search. You can type in a single word in the descriptive-name field and get a list of all files that have that word anywhere in their names. And if you need more search power, you can use the program's full-text indexing and search to find files that contain combinations of words anywhere in their documents.

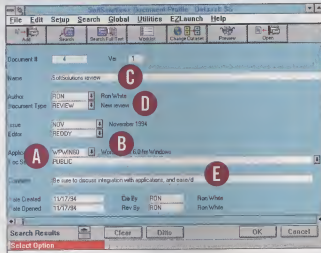
SoftSolutions Suite can also search for concepts, so that a search for *United Kingdom* will flag documents that contain *Great Britain*. A separate part of the suite, the Document Desktop, lets you create folders and filing cabinets for organizing your documents and projects. This can make searches even easier.

A Workgroup Wonder This high level of document management is best used on a network, where several people need to work with the same collection of documents. SoftSolutions Suite has anticipated every workgroup imaginable: It maintains an audit trail of previous versions of a document, lets users know who's currently working on a file, and lets you "check out" documents to nonnetworked systems—the perfect option for laptop users.

Of course, being a heavy-duty network package means that you're better off leaving the installation and customization to someone in MIS. Although the profile screen is child's play for an end user to work with, setting up SoftSolutions Suite and designing a custom profile screen is not easy. This is one program where the installer will actually have to crack the manuals.

It's ironic that SoftSolutions Suite was recently acquired by WordPerfect. WordPerfect 6.0 for Windows already has most of the document management features found here, including long descriptive filenames, searchable summary fields that are the equivalent of profile fields (though they can't be customized), a fast indexer, full-text search, and a versatile viewer. The networking and customizability of SoftSolutions Suite still gives it a place in WordPerfect shops, but it will be even more welcome in offices using Microsoft's Word and Lotus's Ami Pro.

RON WHITE



Let's See Some ID: Manage a LAN full of files with SoftSolutions Suite. The document profile is its basic tool for keeping track of your word processing, spreadsheet, and graphics files.

Open Says Me: When you open a file from within an application, SoftSolutions Suite displays a dialog box that reminds you to create a profile for the new document. If you don't do it immediately, you can create one when you save the file.

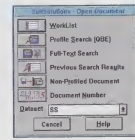
A. SoftSolutions Suite works with **word processors**, spreadsheets, Lotus Notes, and MS Mail.

B. It lets you add **custom fields** specific to your workgroup.

C. It also lets you give files long **descriptive titles** so you're not hampered by cryptic DOS filenames.

D. The program provides some basic **profile fields** (complete with drop-down list of valid data types).

E. You can also add **comments** of up to 3,000 characters in length.



FILEBOX

SoftSolutions Suite 4.0

Memory Requirement: 4MB of RAM.

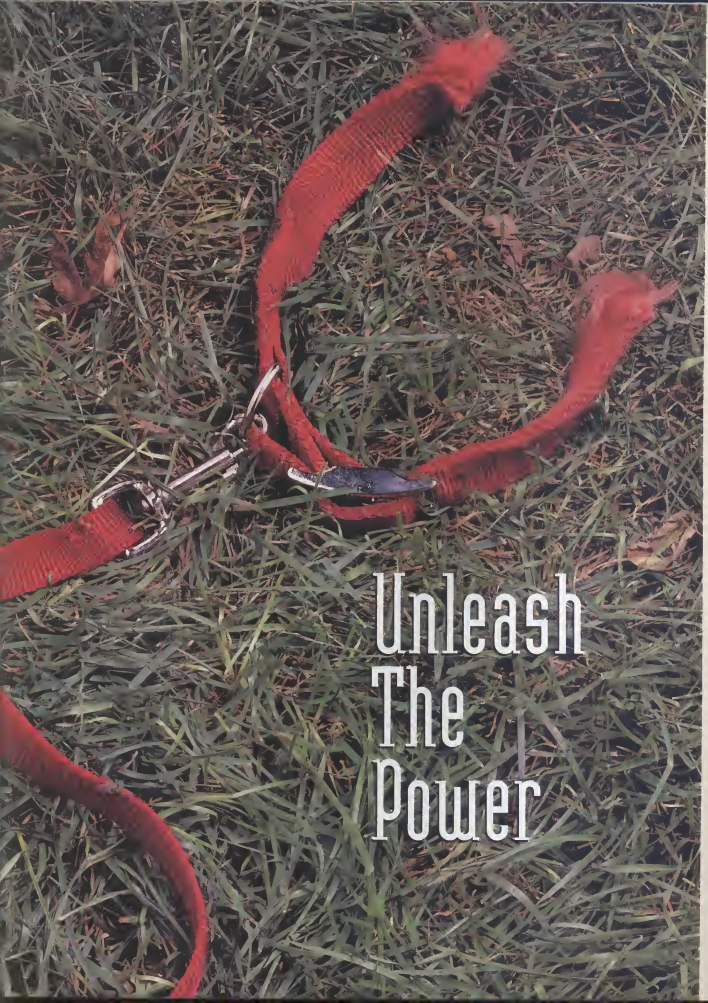
Hard-Disk Footprint: 15MB plus space for indexes.

Works with: WordPerfect, Word for Windows, Ami Pro, Excel, Lotus 1-2-3, MS Mail, Notes, Office 4.0, and others.

Networks Supported: NetWare, Unix, OpenVMS, and others.

$895 for both Windows and DOS file server versions; $595 for one; $395 for workstation version
WordPerfect, The Novell Applications Group
(801) 228-8000
Reader Service No. 642

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*


Unleash
The
Power



*48-Hour QuickShip program applies only to the ColorBook 4SX-33 configuration. Your PC will be delivered to you within two business days from the time of order. No additions or deletions can be made to the configuration. Available for approved credit card orders only. Domestic U.S. only. ©1993-1994 Gateway 2000, Inc. Gateway 2000, HandBook, black-and-white spot design, "G" logo and "You've got a friend in the business" slogan are registered trademarks and ColorBook, EZ Point and TelePath are trademarks of Gateway 2000, Inc. The Intel Inside Logo and Intel are trademarks or registered trademarks of Intel Corporation. All other trademarks, product names are trademarks or registered trademarks of their respective companies. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping or applicable sales tax.

It Sizzles!

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ColorBook DX2-50, PC World, July '94
ColorBook DX4-75, PC World, August '94
Only Color Portable With Microsoft Office Professional Software Included!

Hot Deal!!!

$999

HandBook 486SX-33
With 130 MB Hard Drive.
World's Smallest Windows PC.
Only 2.9 lbs.

...When You're On The Fly

I'm just not ready to be chained down to one master! I gotta find wings to soar with the eagles! Fly with the basset hounds! All I really need is a Gateway 2000® HandBook® 486 to take with me when I'm on the loose. The HandBook 486SX-33 will set me free with a 130MB hard drive and Microsoft Works™ for an unbelievable $999! That's a hot deal that has all the dogs barking.

Fifi will love it, too! I can howl outside her kennel while I modem reminders to my owner to refill my food bowl. The HandBook measures only 10 by 6 inches, small enough for me to carry when I'm chasing down fire trucks.

My master has to understand: I can't stay tied to a fence post all day. I'm a busy dog! Maybe if I explain it to him with pictures. A ColorBook™ from Gateway 2000 will make him sit up and take notice. Even though *I'm* colorblind, I can show *him* brilliant color and desktop performance with prices as low as a basset hound's belly.

Gateway has the selection I need, too, from the popular $1,999 486SX-33 to the power-packed DX4-75, one of the fastest 486 notebooks available today. The DX4-75 even has a 10.4-inch dual-scan display, the biggest most affordable screen in the entire canine world. Don't go barkin' up the wrong tree. Call a friendly Gateway 2000 sales representative for your perfect portable PC!



intel inside

*Intel Verified: Upgradable

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- 78-Key Keyboard
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$2599

COLORBOOK DX2-50

8MB RAM, 340MB HD, 96/24 Fax/Modem Case, 10.4" LCD

$3199 ***MS Office Professional!***

COLORBOOK DX4-75

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$3699

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- Extended VIP Warranty. We'll ship a replacement notebook within 24 hours during the warranty period. Must be purchased at point of sale. **$100**

PCMCIA Cards

- TelePath 14.4 Fax/Modem. **$249**
- 96/24 Fax/Modem. **$149**
- VGA Adapter. **$229**
- External Tape Backup Unit. **$295**
- Ethernet Adapter. **$149**
- Token Ring Adapter. **$449**

OPTIONS FOR THE COLORBOOK

- Extra 2.2Ah NiMH Batteries. **$119** Each
- Citizen PN48 Portable Printer. **$229**
- 4MB RAM Upgrade **$249**
- Extended VIP Warranty. We'll ship a replacement notebook within 24 hours during the warranty period. Must be purchased at point of sale. **$100**

PCMCIA Cards

- TelePath 14.4 Fax/Modem. **$249**
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Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays(CDT)

Seizing the Day, Hour, and Minute

Whether you charge by the hour or by the project, you need an accurate and easy way to track time, record costs, and bill clients. Of course, you don't want this to cut into your billable hours. Two time-tracking programs, Timeslips 5.1 for Windows and ProSoft's Carpe Diem for Windows, can help.

Both Windows-based products track time for business billing purposes, but are aimed at completely different markets. Timeslips, which includes multiple-project tracking for individual clients, is a smart solution for single users and small companies. Carpe Diem, on the other hand, is groupware that can be customized to reflect specific corporate billing procedures, and is a better choice for large companies with extensive billing and time-management needs.

Synchronicity Timeslips features a variety of user-configurable reports (including billing, receiving, and payment reports) and can track separate projects for the same client.

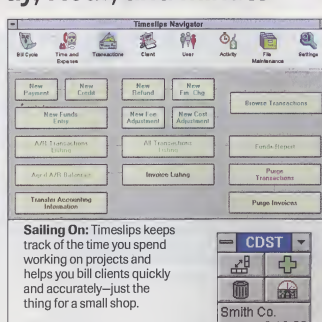
For first-time users, Timeslips' Navigator (a series of PERT charts) guides you through basic procedures. Using the Navigator is like having your own personal time tutor. Select a procedure from a row of icons—Bill Cycle, for example—and the Navigator switches you to the appropriate procedural chart. Click on the area you want to access—Aged A/R Balances under Transactions, for example—and the Client Reports dialog box pops up. The Navigator makes time accounting a breeze.

Marking Time Carpe Diem, by contrast, is a groupware time solution that focuses on automation and ease of use. If you need to track time among diverse networked users in a large corporation, this is your answer. You create the prototype, adhering to your company's billing conventions, while Carpe Diem tracks time and updates bills. The program is also an excellent time-management tool for tracking exactly how much time was spent on any specific task.

If your business juggles clients and billing plans, you'll benefit from Carpe Diem's SmarTimer. This is a configurable floating time palette that lets you create as many separate stopwatch timers for various projects as needed. Each tracks time in any Windows application, and each timer can represent a different client or individual projects for the same client. For instant time tallies, you can drag and drop SmarTimer results to a timesheet to update your billable hours. Also, Carpe Diem's central database runs on any network and works with any billing system that imports and exports ASCII files.

Of the Essence While single users and small companies without separate "front" and "back" offices will find Timeslips' complete time tracking and billing indispensable, larger companies should consider the higher-end Carpe Diem, with its extensive billing system compatibility. Either way, if you bill by the minute or by the project, these solutions are worth your time.

BARRY BRENESAL
AND JAMES OLIVER CURY



Sailing On: Timeslips keeps track of the time you spend working on projects and helps you bill clients quickly and accurately—just the thing for a small shop.

The Smart Way: Carpe Diem functions as an add-on to existing billing and reporting systems. Its SmarTimer floating stopwatches let accountants track time, which assistants can then use to incorporate into data entry.

Timeslips

USABILITY: *Navigator makes for easier, faster task completion.* ★★★★

TECHNOLOGY: *Batch processing speeds billing reports considerably.* ★★★

VERDICT: *Ideal all-in-one time solution for a small office.* ★★★★

Carpe Diem

USABILITY: *SmarTimer, icons, drag-and-drop capabilities make it a snap.* ★★★

TECHNOLOGY: *Network support ideal for large enterprises and multiple offices.* ★★★★

VERDICT: *Integrates easily with existing billing systems.* ★★★★

FILEBOX

Timeslips 5.1 for Windows

Competition: Satori's Project Billing, DesignSoft's Time & Billing.

System Requirements: 386, 4MB of RAM, 9MB of hard-disk space.

New Features: Navigator guides, Bill Layout tool.

$299.95 for single station (up to 8 users), $79.95 upgrade; $599.95 for two-station network version (up to 250 users)
Timeslips Corp.
(800) 285-0999, (508) 768-6100
Reader Service No. 643

Carpe Diem for Windows

Competition: ASA's Distributed Time Entry.

System Requirements: 386, 4MB of RAM, 2MB of hard-disk space.

New Features: CDTracker and CDEntry modules; SmarTimer stopwatch.

$3,000 (up to ten users)
ProSoft Corp.
(800) 477-6763, (214) 386-7769
Reader Service No. 644

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

New! SOFTWARE: Executive Information System

USABILITY: *Create graphs, charts, and presentations with ease.* ★★★★
TECHNOLOGY: *Links to external databases, good visualization tools.* ★★★★
VERDICT: *Outstanding tool for business analysis and presentations.* ★★★★½

Accounting with a Panoramic View

To get a real return on the accounting information your company collects, everyone should have access to it in one form or another. Some people need inventory reports, others need market penetration data, and top-level planners need quick access to graphs of sales figures. Unfortunately, trying to get these figures from the raw financial data of most accounting systems is a trial.

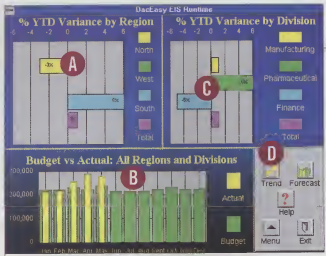
Easy Viewing DacEasy's new DacEasy Executive Information Service (EIS) provides a helpful window into your finances in the form of slide-show–quality graphics. Its displays are understandable and, when necessary, uneditable. With DacEasy EIS, you can create dynamically linked graphs and charts that change as their underlying data changes. Competitors such as Cognos's PowerPlay or Forest & Trees for Windows cost at least ten times as much, yet don't offer all the features of DacEasy EIS. Best of all, you don't have to be running DacEasy's accounting package to leverage DacEasy EIS. It smartly employs Microsoft's ODBC and DDE technology to cooperate and connect with most databases and spreadsheets (Excel, Access, Btrieve, dBASE, Lotus 1-2-3, FoxPro, and Paradox). DacEasy EIS supports both warm and hot links to Lotus 1-2-3 and Microsoft Excel using the DDE Query function; other file formats are supported through ODBC.

Stone Template Pilots DacEasy EIS includes 14 different screen templates to get you started. For instance, you can select a clustered-bar template to view cumulative profits by subsidiaries. Or, if you're concerned about how much the marketing department is spending, you can select a line-and-point template to view actual spending versus budget. In addition to built-in templates, you can create and save your own custom templates. The editing and authoring procedures for this and other basic functions are easy to learn using the manual and context-sensitive onscreen help.

DacEasy EIS is also useful as a developer's tool for rolling out, evolving, and maintaining prototype EIS applications. For example, using the Authoring, Screen Editor, and Data Editor views, you can create multimedia training applications or design workflow status dashboards to keep workgroup members up-to-date on a particular project's progress.

Analyzing financial information such as cumulative profits and budgets is only one example of the power of using DacEasy EIS. It's also useful for building organizational charts and multimedia presentations. Better yet, you can create a DacEasy EIS view and distribute it to every PC in your office—even the aging DOS boxes.

Financial Dashboard If you need instant access to business data in a graphical format in order to make quick decisions—or professional multimedia presentations—DacEasy EIS can meet and even exceed your demands. This program extends your ability to quickly access, understand, and act on vital business information. It's an outstanding competitive weapon. ELLEN DEPASQUALE



Visualize Your Business Data: DacEasy EIS gives you a clear overall picture of your business situation in easy-to-understand charts and graphs. And you don't have to use DacEasy 5.0—EIS supports nine database formats.

A. DacEasy EIS gives you more than a dozen **predefined templates** for charting business progress such as actual spending versus budget.

B. Combine actual and budget data for an **all-inclusive glance** at business performance. All graphics within DacEasy are dynamically linked to the data they represent and change as the data changes.

C. In addition to **polling data by division** (as in this example), you can also chart, graph, and analyze regions, departments, and any other user-defined parameters.

D. Drilling down for underlying information using DacEasy EIS includes running ad hoc trend analysis and forecast chart reports.



We're in Business: Suite-like integration is a smart part of the DacEasy EIS toolbar. Here you can instantly access information on five key business areas: Customers, Vendors, Products, Banks, and Financials.

FILEBOX

DacEasy EIS

Competition: Cognos's PowerPlay, Forest & Trees for Windows.

System Requirements: 386SX or later, 2MB of RAM, 3MB of hard-disk space, Windows 3.1 or later.

Bonus: Networkable for multiple users right out of the box.

Additional Features: Drill-down data queries, ad hoc reporting functions, online context-sensitive help, and more.

$299.95
DacEasy
(800) 322-3279, (214) 248-0305
Reader Service No. 645

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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SyncMaster	14GL	15GL	17GL	17GLs
CRT Size	14"	15"	17"	17"
Dot Pitch	.28	.28	.28	.25
Maximum Resolution	1024 x 768	1024 x 768	1280 x 1024	1600 x 1280
Maximum Refresh Rate at Maximum Res. (Hz)	76	76	60	60
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

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New! SOFTWARE: MapInfo 3.0 for Windows

USABILITY: *A complicated program, keep the manual handy.* ★★★
TECHNOLOGY: *Layered approach to graphical data analysis.* ★★★★
VERDICT: *Powerful mapping tool will improve your business perspective.* ★★★★

Charting a Business Course

Not long ago, analyzing business data meant delving into miles of dot matrix printouts—with a bottle of aspirin nearby. Then spreadsheets became powerful visual tools featuring 3-D graphics, and made your data a little more accessible. But something was still missing. If only you could view your business geographically, then you'd be able to answer the really important questions: Which state buys the most widgets? What's the median age and income for customers in the northern district? If this is the information you're looking for, consider a geographic information system (GIS) like MapInfo 3.0 for Windows.

MapInfo 3.0 is a relational database tool with a twist: a map-based front end that incorporates data from your database, spreadsheet, or remote SQL databases, in addition to CAD packages and ASCII files.

Color By Numbers There are several ways to view your chart data. The first is called Thematic Mapping, which color-codes map elements (like states) based on your data. You can also place charts with more detailed data (like ethnic demographics) over each state. Once the data is displayed, you can double-click on a region to see a row-and-column display of the data for that area.

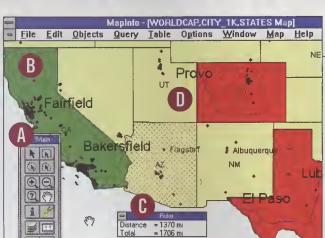
MapInfo can also correlate its own geographical datapoints (cities and other elements) with your database. You can choose to display only cities with total sales over a certain amount, for example.

In addition to the mapping regions supplied, you can add your own maps. These extra maps can be used either as primary backgrounds for your data or as overlays for the included maps. Of course, any data to which you can assign geographical coordinates can be mapped and correlated with other data. For example, if you have a collection of business locations and want to show which are generating the most sales, it's as simple as correlating two databases to create an easy-to-visualize depiction of the successful regions.

Off the Beaten Map MapInfo also offers MapBasic, a scripting language sold separately for in-house application development. For easy distribution, applications written in MapBasic can be compiled into executable files.

Several spreadsheet applications have added limited mapping functions, yet none offers the GIS power of MapInfo. Lotus 1-2-3 Release 5, for example, has a built-in mapping module that can automatically display a map with color coding based on data ranges, but only if country or state codes are included in a range of data. MapInfo can use other types of geographical coordinates, such as geocodes or latitude and longitude, to generate similar maps.

MapInfo is not a program you can learn by simply clicking on things to see what happens. It's intuitive to a point—and then you run into new concepts like geocodes, which will send you running to the manual for explanation. But it's worth the steep learning curve. MapInfo 3.0 is a powerful geographical analysis tool that lets you look at your business from an entirely new perspective. **YAEL LI-RON**



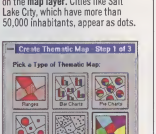
Seeing the Forest and the Trees: In addition to color-coding portions of a map according to their underlying data, MapInfo lets you place charts and graphs over specific regions on the map or view the information the old-fashioned way—in a table, spreadsheet style.

A. The floating toolbar displays **commonly used tools** for map annotation and manipulation.

B. Thematic Mapping helps you visualize **underlying data** by designating different colors to represent different data.

C. The Ruler gives you the distance between two points and **tallies the total distance** between any number of points on your map.

D. Data is graphically represented on the **map layer.** Cities like Salt Lake City, which have more than 50,000 inhabitants, appear as dots.



Follow the Bouncing Ball: This Wizard-like dialog box walks you through the creation of a Thematic Map quickly and easily.

FILEBOX

MapInfo 3.0 for Windows

Competition: Atlas GIS, SureMaps.

System Requirements: 486, 4MB of RAM, 11MB of hard-disk space (including sample maps), Windows 3.1 or higher.

Scripting language: MapBasic (sold separately).

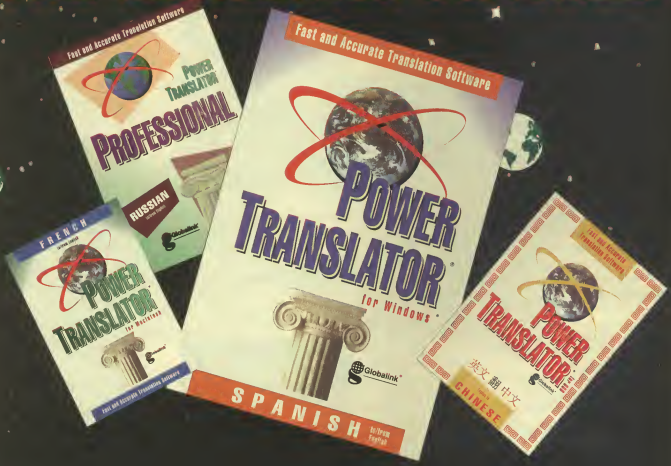
Raster Image File Formats Supported: BMP, GIF, JPEG, PCX, SPOT, TARGA, TIFF.

$1,295; MapBasic, $795
MapInfo Corp.
(518) 285-6000
Reader Service No. 646

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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New! SOFTWARE: Photoshop 3.0 vs. Picture Publisher 5.0

Pictures Worth 2,000 Words

SNEAK PREVIEW

If you're selling your business or product by using photographs, they have to compete with Madison Avenue's finest. But what if your pictures are worth only a dozen words? Use a high-end image editor to start turning out better pictures faster. Previous versions of Adobe's Photoshop and Micrografx's Picture Publisher already had enough tools, filters, and features to handle almost any type of image processing. But in their new releases, these two programs focus on the professional's holy grail: productivity.

In the Shop Photoshop 3.0 is an all-round heavyweight, even in price: $895. The important addition to this version is support for multiple layers, which lets you run through combinations of text, effects, and filters before committing to a final image. This is the next best thing to multiple undo levels (which Photoshop lacks).

Adobe also has enhanced the program's precision color tools. For instance, you can specify the precise amount of ink for individual color plates or channels and have the program alert you when any area in an image is out of the CMYK gamut (so you can correct color *before* paying for hard copy). Also new is a Replace Color feature for quickly creating masks that are based on colors or color ranges.

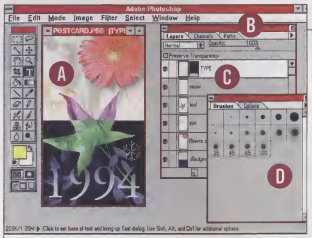
In addition, you'll find some new creative tools, including multiple source lighting effects, a mezzotint filter, new plug-ins, and the ability to arrange and group palettes in any order.

Publish or Perish Picture Publisher packs power similar to Photoshop's, but it costs $300 less and beats Photoshop on many ease-of-use features. Version 5.0 has Windows 95-style tabbed dialog boxes (like Photoshop) as well as an infinite undo feature.

But these additions pale next to the possibilities of Picture Publisher's unique Command Layering feature. This saves all the commands you make, letting you easily delete, edit, or otherwise rearrange any commands you've applied to an image from the command list. One killer usage of this feature: You work on an image in low-resolution mode for speed, then apply all the steps to the high-resolution image at the end of the day. This prevents the system-slowing process of changing multimegabyte images from eating into your valuable working hours.

Picture Publisher's other advantages: its text feature (which lets you edit directly onscreen), modest system requirements, and raw speed.

All told, we preferred professional-strength Photoshop's look, feel, and command palettes. But its hefty price and system requirements place it in the domain of graphics professionals. Picture Publisher plays second fiddle, but it has more usable features. JON PEPPER



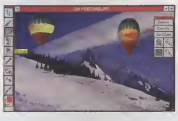
A. Support for multiple PostScript layers provides a **virtual undo** feature that beefs up the one level of undo from the Edit menu.

B. Windows 95-style tabbed **dialog boxes** cram more features into single palettes—no more clumsy menu-based interface.

C. The focus on layers is handled in **cast-list dialog boxes** in which each level is named, defined, and made easily accessible.

D. Floating palettes expand the power of the standard tool palette.

Artist's Checklist: Picture Publisher (below) has all you'd expect from a photo-editing package—layers, rich tool palettes, transparency, masking, and a command recorder that lets you save, edit, and replay series of effects on pictures.



Photoshop 3.0

USABILITY: *Layer support and palette-based editing are vast improvements.* ★★★

TECHNOLOGY: *Layers and accessible color management.* ★★★★

VERDICT: *Professional-strength tools, but lacking key features.* ★★★

Picture Publisher 5.0

USABILITY: *Vast improvements over last version—and it was easier to begin with.* ★★★★

TECHNOLOGY: *Layers? Check. Filters? Check. Command recorder and editable macros? Whoa!* ★★★★

VERDICT: *Fast, smart, low price.* ★★★

FILEBOX

Photoshop 3.0 for Windows

Suggested System: 486 or better with 8MB of RAM.

Hard-Disk Footprint: 20MB or more.

Main Enhancements: Layers, new filters (and a filter factory to make your own), color replacement, gamut warning.

$895
Adobe Systems
(800) 833-6687, (415) 961-4400
Reader Service No. 647

Picture Publisher 5.0 for Windows

Suggested System: 386 with 4MB of RAM.

Hard-Disk Footprint: 21MB.

Main Enhancements: Command recorder that makes logs you can save, edit, and replay; speed and system resource use enhancements.

$595
Micrografx
(800) 676-3110, (214) 234-1769
Reader Service No. 648

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

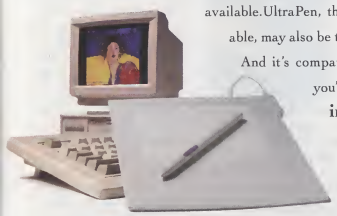
BRING YOUR CRAYONS TO WORK.



ArtPad is a full-featured, high-performance graphics tablet that lets you draw, paint or just plain create, right on your computer.

The Wacom UltraPen

To anyone who's ever thought..."I'm gonna have to draw these guys a picture," here's your chance. From personalized memo's to flow charts to sketches, layouts and logos. Even annotated mail with your pen software. Introducing the Wacom **ArtPad.**™ It's a small and handy, but thoroughly professional graphics tablet from the maker of the world's most critically acclaimed and widely recognized tablets. ArtPad ships complete with the Wacom **UltraPen,**™ the only cordless, batteryless, **pressure-***sensitive* pen available. UltraPen, the most natural computer drawing tool available, may also be the *best way to navigate* on a computer. And it's compatible with just about everything. So, whether you're speeding through a spreadsheet or **adding impact** to *e-mail*, get the Wacom ArtPad. For when you just gotta color outside the lines. For more information on ArtPad or the names of authorized dealers nearest you, please call **1-800-922-6620** dept. 100 today.



Smaller than most mousepads, ArtPad measures only 6 x 7 inches. ArtPad is available in both Macintosh® and PC versions.

WACOM®

Wacom is a registered trademark and ArtPad and UltraPen are trademarks of Wacom Co., Ltd. All other brand and product names are trademarks or registered trademarks of their respective holders. ©1994 Wacom Company, Ltd. All rights reserved

Circle 111 on reader service card.

New! SOFTWARE: Acrobat 2.0

Online Documents with Style

USABILITY: *Creating, reading, annotating, and searching fully formatted PDF files couldn't be easier.* ★★★★
TECHNOLOGY: *Multiple master fonts and multiple graphics compression techniques.* ★★★★★
VERDICT: *Prices are now in line with the competition—and features are way ahead.* ★★★★

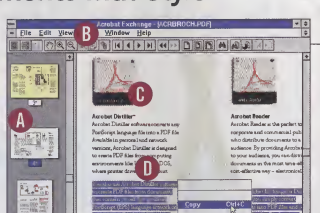
SNEAK PREVIEW

You don't need to be sold on the benefits of distributing formatted documents electronically. Like most companies, yours is spending too much money on printing, paper, distribution, and mailing. Last year, Acrobat's portable document format (PDF) promised to slash that budget with fully formatted files any system could open.

However, the first iteration of Acrobat had its drawbacks, which other contenders in the electronic document market exploited. The Acrobat Reader cost $50 a seat—Common Ground, Replica, and WordPerfect Envoy gave theirs away for free. Reading and writing Acrobat required Adobe Type Manager (ATM), which proved to be a support hassle for some companies. No such restrictions applied to the others.

More Agile Acrobat Acrobat 2.0 has swept aside the minor drawbacks of its previous version. Using a small loadable version of ATM, you can dispense with the full version if you wish without sacrificing the clarity or capability of Adobe's multiple master fonts—the key to their stellar font-matching capability.

And now you're free to send out a free mini-viewer that supports reading, copying, and printing. The bottom line: You no longer have to second-guess the configuration of your recipients' systems—they don't need ATM, and they don't need reader software (readers are also available online or on request from Adobe at nominal cost). They don't even need PCs running Windows: Acrobat has support for Macs, DOS, OS/2, and Unix systems (the others don't go beyond Mac support).



A. Thumbnails and bookmarks now support drag-and-drop rearrangement.

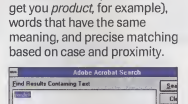
B. PDF files now support **links to external documents** and collected annotations.

C. In addition to **better graphics compression,** graphics can now be cut and pasted from PDF documents.

D. DTP-style **article links** follow articles, even when they jump pages.

E. Right-click for **context menus** to copy documents to the Clipboard.

I Need the Data Yesterday: Acrobat's Viewer is vastly improved by a robust search engine. Seek out words based on their word roots, words that sound the same (*predict* will get you *product*, for example), words that have the same meaning, and precise matching based on case and proximity.



Documents that are distributed online are more accessible than paper ones. Acrobat 2.0 has made them more so.

Not only can you search the full text of documents—including the words in PostScript graphics—you can also dig up PDF documents by their creation and modification dates, search for words based on their word roots (*manager* will get you *management*, *managed*, and so on), and find misspelled words or synonyms using the "sounds like" and thesaurus features. Better yet, the catalog feature that comes with the high-end Acrobat bundle for workgroups indexes all your PDF files for quicker searches.

As before, you can annotate existing PDF documents with comments or bookmarks, and print, copy, or paste fully formatted text and full-resolution graphics. If you're collecting notes from your workgroup, you can now assemble the comments from several copies of the document into a single master document.

Safe and Secure New security features include the option to use two passwords—one to open a document and another to add or change notes. You can also prevent copying and printing of documents.

Do you need Acrobat 2.0? If you're sold on online document distribution, the answer is yes. If you're not, consider this: Capable document distribution and management software costing about $150 can pay for itself in printing, distribution, support, and paper costs in a couple of reports. Acrobat has now caught up with and overtaken its competitors on their own ground—simplicity and low price. It maintains its cross-platform lead and goes the others one or two steps better. Why *wouldn't* you need it? **MATTHEW LAKE**

FILEBOX

Acrobat 2.0

Acrobat Exchange: PDF Writer (a Windows printer driver), Acrobat Reader 2.0 (reads PDF files; browses links, bookmarks, and thumbnails; prints files), search engine.

Acrobat Pro: Acrobat Exchange plus Distiller (batch conversion).

Acrobat for Workgroups: Acrobat Pro plus Catalog (builds online indexes of all PDF documents).

Competition: No Hands' Common Ground, WordPerfect's Envoy, Farallon's Replica.

Acrobat Exchange, $195; Acrobat Pro, $695; Acrobat for Workgroups, $1,595 (10 users)
Adobe Systems
(800) 833-6687, (415) 961-4400
Reader Service No. 649

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

DELL LATITUDE XP INTEL DX4 100 MHz SYSTEM

$3399

BUSINESS LEASE* $126/MO.
• 9.5" DUAL SCAN STN COLOR
• 8MB RAM (36MB MAX RAM)
• 340MB HARD DRIVE
ORDER CODE #600011



8 Up to 8 hours of battery life. Yes, you read it right: 8 hours. Of course, your actual battery life will vary depending on nature and frequency of use and configuration.

7 7 ports on our Advanced Port Replicator (complete with Ethernet 10Base-T and SCSI-2) virtually turns your Latitude XP into a desktop for only $199 more.

6 6 lbs. of Latitude* or 5.9 lbs. of Latitude XP and you still get 8 hours of power and 32-bit local bus video on the road.

5 524MB of hard drive space is available. Need we say more?

4 DX4 100MHz processor – the fastest clock speed you can buy in a notebook, and it's available on Latitude XP systems.

3 A 3.3 volt processor consumes fewer watts and pumps out hours of power so you can cruise.

2 2 ways you can get 8 hours out of your Dell* notebook: A single Smart Lithium Ion battery on the Latitude XP. Or 2 bays for two NiMH batteries on the Latitude model (second battery extra).

What are people saying about the new Dell Latitude?

"Dell's new notebook line resets the industry standard for price/performance, all delivered in one of the best designed, ergonomically architected, state-of-the-art systems I've ever seen. It screams. It's the only notebook I've ever used that made it from coast to coast and back."

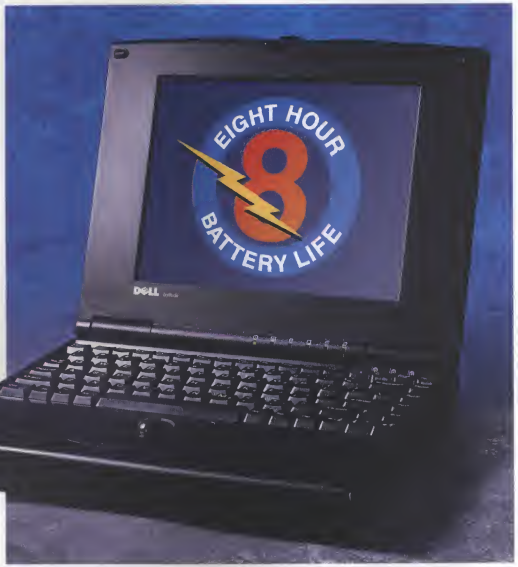
John Dunkle
Workgroup Technologies

"Dell's new batteries and sleep strategies rendered our standard instantly obsolete"

Mark Abrams, VeriTest, Inc.
(Independent Testing Laboratory)

"The new Dell offering has the quality, upgradeability, ease of use and design features – such as dual slot PCMCIA – that fit our needs quite nicely. And the battery life sets a new standard that allows for greater mobility."

David Kacmarek, Principal
Technology Solutions Company





DELL LATITUDE XP INTELDX4™ 75MHz SYSTEM

$3399

BUSINESS LEASE: $126/MO.
- 9.5" DUAL SCAN STN COLOR
- 8MB RAM (36MB MAX RAM)
- 340MB HARD DRIVE
- NEW SMART LITHIUM ION BATTERY
- 3-YEAR LIMITED WARRANTY†
- 30-DAY MONEY-BACK GUARANTEE

ORDER CODE #600011

DELL LATITUDE XP INTELDX4 75MHz SYSTEM

$3699

BUSINESS LEASE: $134/MO.
- 9.5" DUAL SCAN STN COLOR
- 8MB RAM (36MB MAX RAM)
- 524MB HARD DRIVE
- NEW SMART LITHIUM ION BATTERY
- 3-YEAR LIMITED WARRANTY
- 30-DAY MONEY-BACK GUARANTEE

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DELL LATITUDE XP INTELDX4 100MHz SYSTEM

$4799

BUSINESS LEASE: $173/MO.
- 9.5" ACTIVE MATRIX TFT COLOR
- 8MB RAM (36MB MAX RAM)
- 340MB HARD DRIVE
- NEW SMART LITHIUM ION BATTERY
- 3-YEAR LIMITED WARRANTY
- 30-DAY MONEY-BACK GUARANTEE

ORDER CODE #600012

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Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City,* Call 800-228-7811

Keycode #11XDP

DELL™

Less cost. Less hassle.

#1 in the independent VeriTest Steeplechase Battery test.[1] In fact, the Dell® Latitude™ XP DX2/50 destroyed the previous 486 battery life record by almost 5 hours.

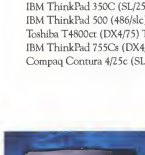


New record

Dell Latitude XP 50MHz STN Steeplechase: 17 hours, 5 minutes

Typical VeriTest Steeplechase Results:[2] [Testing with power management. Actual battery life will vary depending on nature and frequency of use and configuration.]

NEW RECORDS:	*hrs:mins*
Dell Latitude XP DX2/50 STN	17:05
Dell Latitude XP DX4/75 STN	16:01
Dell Latitude XP DX4/100 TFT	14:48
Dell Latitude, 2 NiMH batteries DX2/50 STN	12:15
OLD RECORD FOR 486 MONO:	12:07
IBM ThinkPad 350C (SL/25) passive	8:50
IBM ThinkPad 500 (486/slc) mono	6:30
Toshiba T4800ct (DX4/75) TFT	5:30
IBM ThinkPad 755Cs (DX4/75) passive	5:00
Compaq Contura 4/25c (SL/25) passive	4:32



DELL LATITUDE i486™ SX 33MHz SYSTEM

$1999

BUSINESS LEASE[3]: $74/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM (20MB MAX RAM)
- 200MB HARD DRIVE
- SECOND NiMH BATTERY (FOR 8 HOURS) ONLY $99 MORE
- 1-YEAR LIMITED WARRANTY[4]
- 30-DAY MONEY-BACK GUARANTEE[5]

ORDER CODE #600009

DELL LATITUDE INTELDX2™ 50MHz SYSTEM

$2499

BUSINESS LEASE: $92/MO.

- 9.5" DUAL SCAN STN COLOR
- 4MB RAM (20MB MAX RAM)
- 340MB HARD DRIVE
- SECOND NiMH BATTERY (FOR 8 HOURS) ONLY $99 MORE
- 1-YEAR LIMITED WARRANTY
- 30-DAY MONEY-BACK GUARANTEE

ORDER CODE #600010

DELL LATITUDE INTELDX2 50MHz SYSTEM

$2999

BUSINESS LEASE: $111/MO.

- 9.5" ACTIVE MATRIX TFT COLOR
- 4MB RAM (20MB MAX RAM)
- 200MB HARD DRIVE
- SECOND NiMH BATTERY (FOR 8 HOURS) ONLY $99 MORE
- 1-YEAR LIMITED WARRANTY
- 30-DAY MONEY-BACK GUARANTEE

ORDER CODE #600019

intel inside

[1]*So you've come down here to find out about this Steeplechase thing. Well, it's not a horse race, but a thorough test of battery life. The Steeplechase test includes mechanical typing, pausing, task switching and printing in MS Windows v3.1, MS Word for Windows v6.0 and MS Excel v5.0. All numbers represent an average of at least two trials with power management function enabled. Ten simulates executive usage, i.e. carrying notebook between meetings and intermittent use. Compusearch' times are published in Portable Computing Magazine. For a complete copy of the VeriTest results, call our TechFax™ line at 800-950-1329. Latitude XP is powered by one Lithium Ion battery. Latitude is powered by a NiMH battery with the option of replacing the floppy drive with a second NiMH battery (required for 8 hrs. of battery life), which will increase the weight of the Latitude by 0.5 lbs.* [2]*This 3-year Limited Warranty consists of Dell's standard return-to-depot warranty during the first year, plus a 2-year parts only contract for years 2 & 3. Also included with these systems is 1 year of next-business-day on-site service. On-site service provided by BancTec Service Corp., may not be available in certain remote locations.* [3]*Guarantees available in the USA only for registered owners of Dell systems. For a complete copy of our Guarantees or Limited Warranties, please call our TechFax™ line at 1-800-950-1329, or write Dell USA L.P., 9505 Arboretum Blvd., Austin, TX 78759-7299. Extension Guarantees.* [4]*Prices valid in the U.S. only. Some products and promotions available in the U.S. only. Prices and specifications subject to change without notice.* [5]*Business leasing arranged by Leasing Group, Inc. The Intel Inside logo is a registered trademark and IntelDX2 and IntelDX4 are trademarks of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others.* ©1994 Dell Computer Corporation. All rights reserved.

New! SOFTWARE: Font Works 1.0 for Windows

Working-Class Windows Fonts

USABILITY: *Automatic font substitutions, style guide, easy workgroup management.* ★★★★
TECHNOLOGY: *A whole new direction in typeface science.* ★★★★
VERDICT: *Keeps font matching and management hassles at a minimum.* ★★★★

Fonts are cheap to buy and easy to use, but managing fonts in a workgroup environment is both daunting and expensive. Documents move from computer to computer, and fonts don't. If the appearance of your documents is important, standardize on Elseware's Font Works to remove your workgroup font worries.

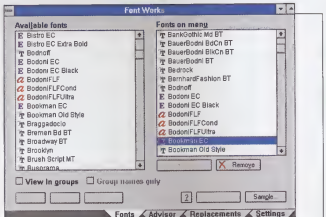
For as little as $30 per PC, Font Works installs 153 typefaces in about 3MB (less than half the disk space you'd expect) and provides tight font management and accurate substitutes when documents arrive with fonts you don't have.

Instead of relying on Windows' TrueType rasterizer or Adobe's Type Manager, Font Works quickly creates TrueType fonts on demand from compact 4K Infinifont files. Only a type expert could spot the difference in printed quality.

Font Works also stores a database of font metrics for more than 500 other fonts. If it recognizes a font name, Font Works makes a forgery of it from some matching font. This font substitution ability differs from Ares's Font Chameleon, which creates new fonts by redesigning or morphing two fonts into one.

Better yet, Font Works provides font group management—including TrueType, Type 1, and Font Works Terafonts—and a Font Advisor tutorial created by type specialist Daniel Will-Harris, which helps you make appropriate font choices for most types of documents.

For handling the myriad of fonts in your workgroup and learning how to use them better, Font Works is your best option. **BOB WEIBEL**



Just My Type: Font Works is great for managing fonts in a workgroup. It's faster, slimmer on disk space, and easier to manage in a workgroup than any other solution—even TrueType and ATM.

FILEBOX

Font Works 1.0 for Windows

Competition: Ares Font Chameleon.

System Requirements: 386, 4MB of RAM (8MB recommended), 3.8MB of hard-disk space.

$129.95 for single user, $600 for 10 users, $1,525 for 50 users
Elseware Corp.
(800) 357-3927
Reader Service No. 650

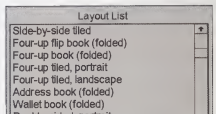
ClickBook

Clip It, Fold It, and Save Money

USABILITY: *Easy to install, a no-brainer to use.* ★★★★
TECHNOLOGY: *Works flawlessly—and saves the environment.* ★★★★
VERDICT: *Lighten your load and reduce paper bills. We like it.* ★★★★

Downsizing. That's just what ClickBook does to your paper bill. This inexpensive Windows utility reworks print jobs into eye-catching booklets that look like they just came from the print shop. And that's only one side effect of squeezing a 120-page report onto 30 pieces of paper—or 5.

To use ClickBook, select the CB printer driver and format your document for a single sheet of paper. Push the Print button, and the ClickBook main menu offers 21 prebuilt formats, ranging from simple double-sided pages to complex cut-and-fold projects.



Pick 'n' Print: Save paper and look sharp by choosing one of ClickBook's page-saving formats—or add your own.

ClickBook rescales the output and sends the reformatted job to the printer. It automatically detects duplexing printers—those that handle both sides in a single pass. On nonduplexing printers, you have to manually reload the paper to print the second side.

Eventually, you'll use ClickBook as your default: Boring reports get lighter and more interesting when they look like they were professionally printed. **ED BOTT**

FILEBOX

ClickBook

Competition: Your local instant printer.

System Requirements: Windows 3.1 or higher, 2MB of RAM, printer.

$69.95
BookMaker Corp.
(415) 354-8166
Reader Service No. 651

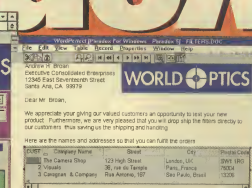
Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Fast start . . . No limits!

NEW VERSION 5.0

Paradox





Paradox for Windows, an integral member of PerfectOffice Professional, has superior integration with suite applications. Thanks to OLE 2.0, you can place any "live" Paradox table directly into a WordPerfect or Word document, and edit it in place. (This is not available in Access 2.0.)

New version is easier than ever

The new Paradox® 5.0 for Windows is here, and managing your business data and building database applications just got faster and easier. New Interactive Coaches quickly teach you how to accomplish any task, while working with your own "live" data. On-line Experts™ guide you step-by-step in creating professional-looking forms, reports, and mailing labels. Even your largest data management tasks will be completed with unbelievable speed and accuracy.

More speed, developer enhancements, and Client/Server connectivity

New Paradox 5.0 for Windows has been tuned to give you the highest possible performance. It stores and retrieves data faster. Delivers answers to queries faster. And for Paradox developers, there's a new Integrated Development Environment and more than 300 new ObjectPAL™ Methods and Properties that help you develop Windows applications in record time. Plus, with the new native SQL drivers, Paradox is ready when you are to upsize your applications to the Client/Server environment.

Comparison Facts

Endeavor Features	Paradox 5.0	Access 2.0
Built-in computer based training	✓	
Integrated graphics	✓	
Built-in workgroup and mail capabilities	✓	
Quick Filter without Query Process	✓	
Power-user Developer Features		
OLE 2.0 client and server support	✓	
Compatibility with applications from previous version	✓	
Transparent connectivity and scalability with database stages	✓	
Record level locking	✓	
Graphical Integrated Development Environment (IDE)	✓	
ODBC compliant	✓	✓
Dedicated high-performance native SQL drivers	✓	

Office Integration outshines Access

Full client and server support for OLE 2.0 and DDE make Paradox for Windows the best database for use with other applications including Perfect Office and Microsoft Office. For example, place a "live" Paradox table directly into a Word document, and edit it in place. *(Can't do that with Access.)*

Try new Paradox 5.0 for Windows today. You'll discover it's the one database with the depth and performance you want to stay with. And watch for the Paradox World Tour coming soon. Call FastFax for dates and locations.

Special competitive upgrade offer **$199.95**

90-day money-back guarantee



See your dealer, or call today!

1-800-336-6464, ext. 9128

In Canada call 1-800-461-3327 FastFax 1-800-408-0001

Borland

The Upsizing Company

Copyright © 1994 Borland International, Inc. All rights reserved Offer good in the United States and Canada only Prices in U.S. dollars. Dealer prices may vary. BI 7401.1

Circle 191 on reader service card.

New! SOFTWARE: The Meeting Room

Let's Do Lunch—Online

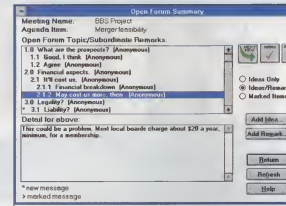
USABILITY: *An easy route to structured online meetings.* ★★★
TECHNOLOGY: *Lets DOS and Windows users into the same meetings.* ★★★
VERDICT: *Arguably better than a face-to-face meeting when structured decision making is important.* ★★★

Face-to-face meetings will never die, but Eden Systems' The Meeting Room goes a long way toward making them endangered species. A real-time online conferencing program, it lets participants "drop in" on discussions as developments require. And if the network permits remote log ins, participants on the road can connect via modem to check in on meetings.

The leader creates the meeting, builds the agenda, chooses participants, and issues invitations via e-mail. The program helps organize ideas, comments, and responses into a format that makes it easy for participants to follow. The Meeting Room even includes a spelling checker. For the sake of flexibility, the leader can alter the agenda and invite new participants during the meeting as developments warrant.

In addition to open discussions, there's a private chat facility. Also, files can be imported into a meeting from ASCII text files and various graphics formats (including PCX, BMP, and GIF) and via OLE. There's even a shared blackboard where graphic images can be annotated using an assortment of drawing tools.

This is a well-designed product that's deceptively powerful for its ease of use. At $895 for a ten-user pack, The Meeting Room is an efficient, economical route to online meetings. DENNIS FOWLER



We Can Go On Meeting Like This: Eden System's Meeting Room Open Forum provides anonymous discussion on specific project agendas and topics, letting participants add and view related ideas and remarks quickly, easily, and candidly.

FILEBOX

The Meeting Room

Competitors: Ventana GroupSystems V and VisionQuest at twice the price.

Network Requirements: Any Novell or NetBIOS compatible network, including Windows for Workgroups, LANtastic, and LAN Manager.

Server Requirements: 12MB of hard-disk space for DOS version, 10MB for the Windows version, a total of 17MB for both.

$295 per user
Eden Systems Corp.
(800) 779-6338, (317) 848-9600
Reader Service No. 612

MicroHelp UnInstaller 2

Windows Cleanup (with Smudges)

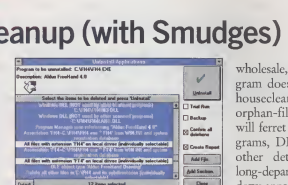
USABILITY: *Handy icon toolbar, overzealous confirmation dialogs.* ★★★
TECHNOLOGY: *Analyzes EXE files to track associated DLLs.* ★★★★
VERDICT: *Removing apps? Install this first.* ★★★★

You can't afford to support dead wood, not on your staff and certainly not on your PC. But just try to eject an underperforming Windows application—you can't get rid of it.

Most Windows programs scatter files throughout your system and don't tidy up after themselves. Cleaning house should be easy, but it requires a specialized tool like MicroHelp's UnInstaller 2.

Simply put, UnInstaller 2 erases all traces of unnecessary Windows applications from your system. For safety, the program has options for trial uninstallation and backup-before-deletion. And, in addition to deleting applications wholesale, the program does general housecleaning. An orphan-file finder will ferret out programs, DLLs, and other detritus of long-departed Windows apps.

If you've loaded several Windows applications, UnInstaller 2 is close to indispensable. It has flaws, but it's the best way to tidy up Windows, short of a complete re-installation. DAVID HASKIN



Spring Cleaning: Windows should clean up after itself, but it doesn't. UnInstaller handles the task with grace.

FILEBOX

UnInstaller 2

Main Features: Duplicate file finder, redundant font and driver deletion, uninstallation of entire apps, orphaned file deletion.

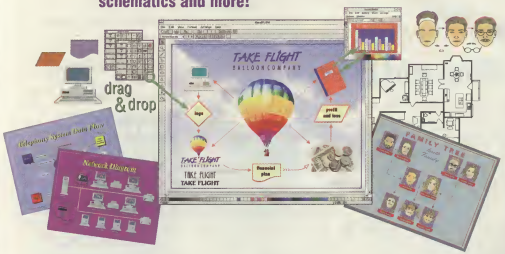
$69.95
MicroHelp
(800) 922-3383
Reader Service No. 613

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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New! SOFTWARE: SideBar 2.01 for Windows

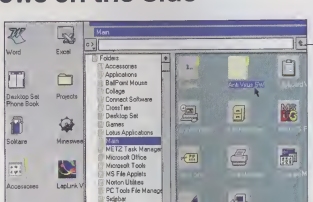
A Little Windows on the Side

USABILITY: *Some brilliant touches, a few blunders.* **
TECHNOLOGY: *Compact, simple, fast.* ***
VERDICT: *A fair value with an eye to the next version of Windows.* ***

Killing time until Windows 95 arrives? You could play a few hands of solitaire—or you could rearrange your desktop with Quarterdeck's SideBar 2.01 for Windows, the latest minimalist Program Manager replacement.

SideBar provides a sneak peek at elements you'll see in the Windows 95 shell. You can drag program items, folders, and data files onto the desktop. A customizable icon bar with a clock and Run button can be anchored on either side of the screen. A fast File Manager replacement displays Program Manager groups as folders in the same treelike display. And yes, you can nest folders within folders.

The interface's otherwise elegant appearance is marred by a few downright ugly sections. The File Manager's use of drag and drop isn't consistent with the rest of the program or the rest of the industry. Clunky confirmation dialog boxes are filled with empty space and ungrammatical messages. Some menu choices are head-scratchers as well: Want to create a new folder? Look for Make, Hidden under the View menu. Fortunately, there are numerous right-mouse–button shortcuts.



A Glance at the Future: SideBar's drag-and-drop folder-based File Manager and icon desktop are a taste of things to come from Windows 95.

We found a few minor display bugs along with missed opportunities. The drag-and-drop Recycler, for example, is welcome, though it would be better if it could link to an Undelete program. And why doesn't SideBar's clock let you reset the system date and time if you double-click on it?

Despite these flaws, SideBar 2.01 is a capable Program Manager replacement that's especially stingy with system resources. And its modern interface suggests it has a promising future, even after Windows 95 arrives. **ED BOTT**

FILEBOX

SideBar 2.01 for Windows

Competition: Dashboard (SideBar has more features, but Dashboard is more consistent).

Main Features: Drag-and-drop file management, nested folder file management, recycler file deletion.

$59.95
Quarterdeck Office Systems
(800) 354-3222, (310) 392-9851
Reader Service No. 654

Quick Restart for Windows and DOS

Save Yourself Time and Energy

USABILITY. *A one-click timesaver.* ****½**
TECHNOLOGY. *Brings laptop features to desktops.* ***
VERDICT. *Saves time and headaches, cheap.* *****

Say Word for Windows is running, with three unsaved documents still waiting to be named. Say you've been working on a complex CorelDraw graphic for hours and haven't saved it either. Say the security guard downstairs has just called to inform you that your car is being towed away. Say you don't function too well under that kind of pressure.

For laptop owners, this scenario is all in a day's work. Just press the Autoresume button and run. Your work, though not yet saved, is intact. Next time you turn the machine on, the entire configuration is there, right where you left off. No need to reboot or reload Windows, Word, Corel, and all your files, because they've been frozen in time.

Alas, most desktop computers are still a long way from this convenience. PowerPro Software's Quick Restart is a solution. It's a software-based panic button, and once you see it, you may wonder how you ever managed without it.

Quick Restart offers fast and safe power-down at the press of a predefined hotkey. It's that easy. But the program also serves an important role beyond moments of terror. Press the hotkey at the end of the day, and you won't have to repeat that tedious startup procedure tomorrow morning.

This little gem has a RAM footprint of only 15K of conventional memory and 6K of high memory. There's a DOS interface as well as a Windows module, and both install during the simple setup procedure. Now, isn't that a better alternative? **YAEL LI-RON**

FILEBOX

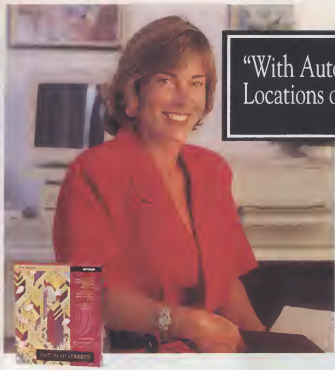
QuickRestart for Windows and DOS

Competition: Any portable with autoresume BIOS.

Requirements: Enough free hard-disk space to take a snapshot of RAM and virtual memory.

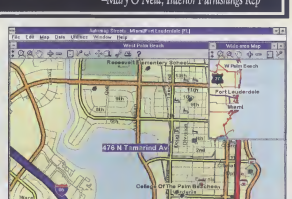
$89.95
PowerPro Software
(415) 345-9278
Reader Service No. 655

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*



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intel inside

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+

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+

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+

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+

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+

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+

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+

3.5" 1.44MB Diskette Drive

+

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+

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+

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+

Preinstalled MS-DOS 6, MS-Windows 3.1, TabWorks and Lotus Organizer

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Easily send, reply or forward any message—even attach files. E-Mail Connection's single interface makes e-mail management simple.

It's so convenient it automatically signs-on to retrieve and send messages, whenever you want—hourly, daily or weekly. There's no need to jump between services to check your mail.

The E-Mail Connection Address Book even logs and files the names and e-mail addresses of the people with whom you communicate, automatically.



Reviews

"E-Mail Connection offers so many benefits that I've made it my standard e-mail program."
Windows Magazine, Dec 93

"E-Mail Connection does the seemingly impossible: it makes electronic mail easy to use."
Computer Shopper, Dec 93

"No other e-mail package comes close to the functionality and flexibility of E-Mail Connection 2.0."
PC/Computing, July 94

"...gets the job done better than any other commercial mail package I've seen."
Wall Street Journal, Aug 93

"E-Mail Connection is the default champion of e-mail collectors."
PC Magazine, Oct 93

"We like the flexibility and routing capabilities E-Mail Connection offers."
Infoworld, June 94

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Internet in a Box vs. NetCruiser

One-Stop Net Shopping

Internet in a Box

USABILITY: *Easy installation, familiar feel of Windows File Manager.* ★★★★

TECHNOLOGY: *Useful Internet tools in a complete bundled suite.* ★★★

VERDICT: *Your best bet for an Internet suite.* ★★★★

NetCruiser

USABILITY: *The easiest intro we've seen to the Internet's complexities.* ★★★½

TECHNOLOGY: *Nothing new, skimps on many features throughout.* ★★

VERDICT: *Very good start for casual beginners, less desirable for serious business users.* ★★★

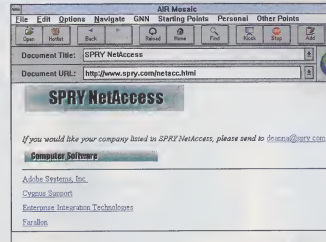
SNEAK PREVIEW

Along with countless other treasures on the Internet, you'll find gigabytes of Windows-based Net navigational software, like Mosaic and Cello, yours to ftp for free. But while such freeware is fine for personal surfing, your business needs something more than the vague hope that the freebie won't crash your entire network. This is where commercial Net applications come in. They aren't always foolproof, but they do include technical support, upgrades, and integrated suite features that lower the learning curve and reduce training and support costs.

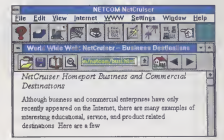
That's what makes Spry's Internet in a Box (reviewed here in beta form) and NetCom's NetCruiser worthy of your attention. While not direct competitors, they mark the first full Net suites to hit the market. Internet in a Box sells for $100 on the street and is designed as a stand-alone product for anyone with Point-to-Point Protocol (PPP) access; NetCruiser software is free with NetCom's service at $19.95 per month plus a $25 start-up fee and fees based on usage.

WebAware If you want Net action, you want access to the World Wide Web, a section of the Net built on hypertext links (see "Untangling the World Wide Web," July, page 113). The most common Web browser is NCSA Mosaic, and Internet in a Box offers a licensed version of it. NetCruiser's browser is different from Mosaic, but it offers an exceptionally well-designed options screen.

In addition, both products offer a full complement of Internet applications, with separate but integrated modules for e-mail, FTP, Telnet, Gopher, and the World Wide Web—in other words, it's all there. So which one should you choose? Our advice is to test drive the bounty of Net freeware first—poke, prod, and putter to your heart's content. Then, if your business demands a uniform suite of several Net applications with strong features, technical support, and upgrades, try Internet in a Box. If you have similar needs but are just starting out, and ease of use is your main concern, give NetCruiser a whirl.



Peer Pressure: Everybody's doing it—getting their businesses on the Internet, that is. Spry's NetAccess, a Web marketplace for hardware, software, and related technology products and services, can be accessed from Internet In a Box's WWW client, AIR Mosaic.



NetCruisin' for Commerce: Additional wired business sites include NetCom's Homeport Business Destinations, a Web home page that can be accessed through NetCruiser's Cello-like Web client. It offers easy-to-use large icons and obvious pull-down menus that integrate the remainder of the suite's modules. A full-screen Kiosk look is also available.

Internet in a Box sports a thoroughly usable installation feature complete with a point-and-click scripting mechanism to automate your network log ins, something it didn't have when *PC Computing* looked at an earlier beta version (see "Nothing But Net," September, page 128). Similarly, Internet in a Box can be installed and shared on your existing network with ease.

Monster in a Box Internet in a Box sports a familiar interface: It looks and feels remarkably like Windows' own File Manager. The folder system in the e-mail module and the directory system in the Gopher program have File Manager's flavor, while the superb Network File Manager window (Spry's take on FTP) opens a local File Manager and gives you a graphical point-and-click view into the remote machine's directories.

Internet in a Box's modules have more features than NetCruiser's. For example, Internet in a Box's e-mail package supports unlimited folders, while NetCruiser's offers only three. Internet in a Box also lets you read from a remote mailbox without automatically downloading all messages. However, it supports only UUENCODE for attaching files, a major flaw given the growing importance of Multipurpose Internet Mail Extensions (MIME), which allow

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

New! NETWORKING: Internet in a Box vs. NetCruiser

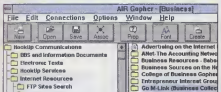
SIDE BY SIDE HAUL IN A FULL NET



FTP à la File Manager: Internet in a Box offers an easy-to-use, click-and-drag FTP interface that looks and acts a lot like Windows File Manager.



Supereasy FTP Cruising: One of the most striking differences between Internet in a Box and NetCruiser lies in their FTP clients. NetCruiser (above) uses a simple, split-screen upload/download directory approach.



Making the Gopher Connection: Internet in a Box's Gopher client, like most of its other modules, takes a Windows File Manager–like approach. AIR Gopher features straightforward directories and multiple windows with scrollbars for easy access to the places you've been in Gopherspace.



Gopher the Gold: NetCruiser's Gopher client is simple and direct—a pleasure to use. The bookmarking feature is a handy method to record your favorite Gopher "digs," though its backtracking and history features are mediocre at best and lack historical detail.

multiple binary attachments to be encoded, decoded, and sent in a single message.

Internet in a Box's feature-rich module approach, backed by technical support, is a good solution if you're shopping for your business, and it should have a street price of $100.

NetCruisin' NetCruiser is great for people who are intrigued by the Net but intimidated by the commands usually required for access. Like Internet in a Box, NetCruiser is a cinch to install. But where Spry lets you choose your own service provider, NetCruiser is geared toward hooking you up to NetCom's service: An 800-number logs you in the first time, and after that you're dependent on the company's incomplete but growing list of local access numbers.

Once you've logged in to NetCom, all of the modules are available from a single pull-down menu, and context-sensitive help and menu items appear after you've selected a particular application.

NetCruiser's e-mail package is usable, but supports only three folders—not enough to sort through a flood of mail. And reading mail and sending mail are two distinct buttons on NetCruiser's toolbar.

Many of NetCruiser's features, including Gopher, Finger, Telnet, and FTP, use NetCom's graphical Internet Site Chooser. This is a colorful map of the United States—simply click on the geographical site you want to access and NetCruiser directs your feature of choice to that location. While easy to use, Site Chooser gives the impression that the Net is a U.S. phenomenon only, and foreign site addresses—if known—must be entered manually. NetCruiser's Gopher client offers only a single site window, giving you little sense of where you've been. The FTP module is similarly simple, though extremely usable.

NetCruiser is a great package for beginners looking for ease of use and simple point-and-click Net navigating—and the price is right. Its context-sensitive help and menu items for each suite module are a nice usability bonus, but some features found in Internet in a Box are simply not found in NetCruiser (unlimited folders, for example).

Internet in a Box and NetCruiser are well-designed products, but each has its share of flaws. Internet in a Box's lack of MIME support is disappointing. NetCruiser's problem is more subtle but perhaps more significant: In use, it feels like America Online, something that helps usability but doesn't give the feel that the Net is a worldwide entity.

Net Result Serious business users should choose Internet in a Box for its feature-rich module approach. Beginners and less-serious Internauts—take a closer look at NetCruiser for its more integrated feel and easy Internet Site Chooser. NEIL RANDALL

FILEBOX

Internet in a Box

System Requirements: 386 or later, DOS 3.1 or later, Windows 3.1 or later, 4MB of RAM, 9,600-baud modem or faster.

Net Features: WWW, e-mail, Usenet news, Gopher, FTP, Telnet, and ImageView (a GIF and JPEG viewer).

$100 est. street price (additional charge for Net access varies by provider)
Spry
(800) 998-4269, (206) 447-0300
Reader Service No. 656

NetCruiser

System Requirements: 386 or later, DOS 3.1 or later, Windows 3.1 or later.

Net Features: WWW, e-mail, Usenet news, Gopher, FTP, Telnet, and Internet Site Chooser, a geographical navigator.

Free software; $25 startup fee, $19.95/month (plus added fees)
NetCom
(800) 501-8649, (408) 554-8649
Reader Service No. 657

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PC World—July 1994

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Circle 257 on reader service card.

USABILITY: *Intuitive access to mail and schedules.* ★★★★
TECHNOLOGY: *Beefed-up mobile computing support, wide-area network features.* ★★★★
VERDICT: *Finally, a groupware package an end-user can love.* ★★★★

A Groupware Rose by Any Name

SNEAK PREVIEW

Novell's GroupWise 4.1 is a great product in search of an identity. In features it reaches into the realm of Lotus Notes, but GroupWise is based around a much simpler electronic mail architecture. Even in name, GroupWise is hard to place. Until recently, we knew the product as WordPerfect Symmetry, and before that it was WordPerfect Office.

Fortunately, GroupWise is good enough to transcend its confusing phylogeny. With a dozen new and renovated client platforms, added Simple MAPI support, a new custom message capability, Internet-style discussion forums, and a raft of mobile computing options, GroupWise has risen above its impressive roots as a workgroup integrator and now stands ready to take on the enterprise.

Smells Suite To the end user, GroupWise looks similar to WordPerfect Office 4.0—which is to say, it looks great. We haven't seen a comparable product that beats the usability and integration of these mail, scheduling, and task features. All your predefined views—personal calendar, mail, group scheduler, task assigner, notetaker, and phone message—can be launched by clicking on the icons that march across the bottom of the main screen. That means no cumbersome switching between different databases or between separate schedule and mail programs. (Lotus and Microsoft, are you listening?) You also get a shelf to store custom views (a to-do list, for example) and favorite applications. If you want it to, GroupWise can do double duty as your Windows shell.

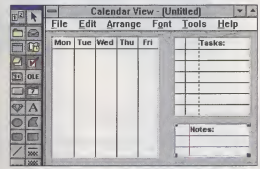


Would Smell as Suite: GroupWise 4.1 has messaging, scheduling, and a collection of workgroup features—all of which make it more versatile than your average e-mail package, though less versatile than full-blown groupware.

A. GroupWise's **personal and group schedulers** let you see custom views of your own calendar as well as create regular or recurring appointments, invite participants, and view their calendars to select the best time for a meeting.

B. You still get all the **mail basics,** including serial routing of messages, support for file or object attachments, and rules to manage your in-box.

C. GroupWise gives you a **task assignment** message that lets you send a task—with due date and attachment—to a coworker.



Form Function: Along with the predefined custom views of your mail and schedule information, GroupWise's View Designer is a forms designer that lets you build views of your GroupWise data that can include graphics, check boxes, drop-down lists, and OLE objects.

In GroupWise 4.1, all this basic functionality is suddenly smarter. Simple MAPI support lets any other MAPI-enabled application now use GroupWise as a mail transport. With the new Custom Messages feature, you can even configure GroupWise to recognize application messages and identify them with unique icons in your in-box.

While GroupWise doesn't have robust discussion databases or replicated public folders like Notes does, you can use the mail program to set up Internet-like forums. You create a mailbox for each discussion topic, and users who want to participate send a message with "subscribe" in the header to be included on the distribution list. Admittedly, it's not an ideal solution—especially if you're used to Notes—but it has the advantage of being easy to set up.

Thorns GroupWise can get a bit prickly at times, especially if you're a network administrator. Despite a supposedly improved installation routine, it's still one of the hardest programs we've ever had to set up. But installation is only one person's one-time headache. More annoying is the fact that GroupWise is impossibly sluggish on 386-class workstations, which are still prevalent as network nodes in many corporations. Those problems notwithstanding, this is still the rosiest contender in the groupware wars. SHYAMALA REDDY

FILEBOX

GroupWise 4.1

Competition: Lotus Notes, Microsoft Exchange Server.

Minimum System Requirements (Windows client): 386 CPU, 4MB of RAM, 17MB of hard-disk space (to run locally).

Remote Support: GroupWise Remote for Windows for mobile clients, Telephone Access Server, Pager Gateway.

$695 (five-user pack for Windows)
Novell Groupware Information
(800) 861-2507
Reader Service No. 658

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

INTRODUCING

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Circle 159 on reader service card.

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Clean Up Your LAN-gauge

USABILITY: *Decent display, confusing keys.* ★★★
TECHNOLOGY: *So much power in such a small case? Bravo.* ★★★★½
VERDICT: *A necessary addition to any network manager's toolbox.* ★★★★

Are your curses cursory? Have your imprecations become uninteresting? Just hang around a network manager when something goes wrong—you'll get a refresher in hurling epithets. And for good reason: We rely on our networks as much as we rely on our phones. An hour of downtime is bound to bring on a pungent phrase or two.

#@&/$!! Of course, why curse when you can just fix the problem? The tiny Fluke 675 Combination Token Ring/Ethernet LANMeter helps you keep your Token Ring or Ethernet network from going south by gathering statistics; testing cables, hubs, and network cards; even generating network traffic. True, the LANMeter won't do everything—it can't capture packets, for example—but for only $9,795 it deserves an award for pragmatic perfection.

At 11.5 inches tall, 6.5 inches wide, and 2.2 inches thick, the LANMeter is the only LAN analyzer we've seen that can test cables and generate traffic in anything less than a notebook form factor. And at 4.5 pounds, it can fit in a briefcase. (Most of the weight comes from its rechargeable NiCAD batteries, which last about two hours.)

The shortcoming of such a small case is that you have to compromise a little on function—for example, it doesn't have an AUI connector—and a lot on usability when compared to a PC-based LAN analyzer. A LAN analyzer really doesn't need a full-sized keyboard, but the LANMeter went a bit too far in the opposite direction, substituting an extended calculator keypad that we almost never touched, some confusing multipurpose keys, and assorted LEDs.



Aw, It's So . . . *Cute* is the first word uttered by anyone who sees the Fluke 675 LANMeter. In addition to its adorable looks, the LANMeter packs a wealth of network hardware troubleshooting tools into a wee form factor. The downside: Its barely usable tiny keypad and itsy-bitsy LCD display.



Net Window: LANMeter's little LCD screen shows important information on your network protocols, packets, and cable integrity.

We tested the LANMeter on a Token Ring network and an Ethernet network, both of which were experiencing four-letter failures. On the Token Ring network, users couldn't see NetWare servers over a bridge. The Ethernet network, on the other hand, was experiencing periodic slowdowns.

We tried to troubleshoot the problem on the Token Ring side by using the LANMeter to create a NetWare server list. We quickly saw that we were not receiving broadcast messages from servers on the other side of the bridge. The LANMeter was unable to suggest a solution. (As it turned out, there was a problem with the source bridge routing.)

Plucked from the Ether

On the Ethernet network, we had a bit more luck. We plugged in the LANMeter, gathered some statistics, and immediately saw a lot of error frames clogging the network. We were able to isolate the source address of the bad traffic, but not which machine it was coming from. We went from port to port on the hub, interposing the LANMeter between every station and the hub, and running the Expert-T Autotest feature, which tests all of the hardware involved. We quickly found that there was a bad network interface card.

For what it does, this is a superlative product. There are, however, a few drawbacks: It doesn't offer "expert" help with diagnosing problems (although it's considerably less expensive than the alternatives we've seen that do). Also, it doesn't support any of the network management standards, such as the Simple Network Management Protocol for gathering remote network statistics. But as an inexpensive, portable network diagnostic tool, there's none better. JOHN MONTGOMERY

FILEBOX

Fluke 675 Combination LANMeter

Competition: Network General Expert Sniffer 4.3 ($30,700), Hewlett-Packard Network Advisor A.05 ($23,500), ProTools' Foundation Manager 1.31 ($18,407).

Weight: 4.5 pounds.

Battery Life: 2 hours.

Network Topologies: Ethernet and Token Ring.

Also Available: Fluke 672 for Ethernet networks and Fluke 670 for Token Ring networks, both priced at $5,995. Both include the same features as the 675, but are not intended for heterogeneous networks.

$9,795
Fluke Corp.
(800) 443-5853
Reader Service No. 659

PHOTOGRAPH BY ARNOLD TSOLEJO

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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Circle 134 on reader service card.

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sloping keyboard that fits more closely to the natural positions of your hands and wrists. And one that is more comfortable, if a bit odd-looking.

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Natural

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hearing can reach Microsoft text telephone (TT/TDD) services at (800) 892-5234 in the United States or (905) 568-9641 in Canada. Microsoft and the Windows logo are registered trademarks and Natural Keyboard and Windows are trademarks of

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This Won't Hurt a Bit

It was not love at first site. When Toshiba's Portégé T3400CT first landed on my desk, I was annoyed by its smallness: small screen, small keyboard, small pointing device. I couldn't help but feel like I was computing in a shoe box.

But as I got used to the keyboard, as my eyes adjusted to the screen, and as I started to get the knack of the eraserhead AccuPoint mouse, I came to realize that this computer is worth the momentary discomfort. It's so small and light (4.4 pounds) that you can carry it in your briefcase—no more separate geek pack for your portable. And we guarantee that nothing excites the envy of the business-class brigade like the Portégé (except maybe the IBM ThinkPad 755). Better yet, it's got enough battery life so that you don't feel power-conscious when you decide to start up Tetris somewhere over Oklahoma.

My Portégé arrived with a small hard disk (120MB) and not enough RAM (4MB). I upgraded it to 8MB and ran DoubleSpace to make up for the hard disk. The newer and more expensive model (the T3600CT) has a 250MB hard disk and a faster processor, and a slightly larger screen.

Toshiba also sells a reasonably priced port replicator for the Portégé (get an extra power adapter to go with it). Despite its Lilliputian proportions, as a replacement for both your current portable and possibly even your desktop, this machine stands tall. RAPHAEL NEEDLEMAN

Portégé T3400CT / Toshiba America Information Systems / (800) 334-3445 / $2,499 as tested / *Reader Service No. 661*

Logbook Entries:

April 23, 1994: *I set up the Portégé T3400CT and transfer my files to it. The Portégé is easy to carry and lasts a long time on a charge, but working on it is claustrophobic. Maybe a few days of use, or a road trip, will cure me.*

May 15, 1994: *I'm a convert. I still think using a real keyboard and mouse is faster, but not by much.*

June 20, 1994: *Keyboard drops characters from time to time. Toshiba says there's a fix, but I will have to send in the unit. I elect to live with the problem.*

September 25, 1994: *An annoyance: The Portégé's LCD takes awhile to warm up. I don't remember this being a problem when the machine was new.*

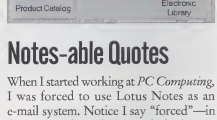
Logbook Entries:

November 4, 1993: *I upgrade to the Notes 3.0 client. I like the new look, down to the new icon.*

April 4, 1994: *I install the Notes 3.0 server and create a full text index on all my databases. They double in size, but searching them is now considerably faster.*

May 21, 1994: *I install Notes 3.1 NetWare Loadable Module on my Pentium file server. Suddenly, accessing files takes longer. Lotus says, "Run the NLM on a dedicated server." Yeah, right. I go back to running the server on OS/2.*

August 21, 1994: *Upgraded to Notes 3.1 on my client. The only thing that changed is the icon. It's now uglier.*



Notes-able Quotes

When I started working at *PC Computing*, I was forced to use Lotus Notes as an e-mail system. Notice I say "forced"—in fact, I spent about three months looking in vain for another package that could exchange mail with Notes before I gave up. But a funny thing happened on the way to the front end: The more I used Notes, the more I liked it.

I got rid of my personal information manager and put all of my contacts' names and addresses into a Notes database. I created one database that contained every computer industry analyst there ever was, another to track the files I was editing, and another to hold all of the magazine's Help tips. I began to think of problems in terms of how long it would take me to create a Notes database to solve them. Usually the time involved was a matter of minutes.

And that's the power of Notes: speed of development. I never wasted effort on creating optimal queries—Notes uses full text indexing. I never once thought about how difficult it would be to make my databases multi-user—they already were.

Still, Notes does have its limits, as I found the hard way when I tried to create a scheduling application for all of *PC Computing*. I wasted months on that project—and I do mean wasted—before I finally gave up.

Obviously, Notes is no panacea, especially if you want a database with sophisticated relational features. But for sharing document-oriented information—any kind of electronic form, for example—nothing beats it. JOHN MONTGOMERY

Notes / Lotus Development / (800) 346-1305 / $495 / *Reader Service No. 662*

PHOTOGRAPH BY JERRY SPAGNOLI



Line Quality

Sure, my Practical Peripherals' ProClass 288 LCD modem is fast—V.Fast, that is. And yes, its display gives better play-by-play than closed-caption TV. But the best thing about my little modem buddy is that it looks *cool*. It's a mini monolith that tilts backward as if caught in a gale-force wind.

But I'm not shallow. This modem has brains as well as looks. Above the standard stretch of cryptic modem LEDs, the ProClass 288 sports a three-line LCD screen, which makes setup and trouble-shooting bad connections a breeze.

While the modem lights twinkle in my peripheral vision, the screen gives me more than 50 real-time status messages about my connect speed, the current time, line quality, the number of fax pages sent or received, and more. If I get lost, there are even six pages of online help in ROM. Plus, I can send and receive faxes at 14.4Kbps, and Practical Peripherals has bundled two communication applications with the PC 288 LCD (Smith Micro's QuickLink II and Delrina's WinFax Lite—both decent solutions for my purposes).

I hope Practical Peripherals will have a true V.34 version of the ProClass soon. However, I'm not pining for standard V.34 speed—which is just as well, since upgrading my ProClass 288 would cost $49 and two days in factory turnaround time. Frankly, I couldn't stand to be separated from it for that long. **RICHARD SCHWERIN**

ProClass 288 / Practical Peripherals / (800) 442-4774 / $429 / *Reader Service No. 663*

Logbook Entries:

May 15, 1994: *To plug serial, power, and phone cables into the ProClass 288, I have to literally wrestle the angled base off the bottom of the modem.*

June 8, 1994: *When two or more status messages are waiting to be displayed, the LCD scroll rate defaults to one second—too quick for my taste. I push a few buttons and reset it to a comfortable three seconds.*

September 20, 1994: *I'm expecting several important faxes the week I'm out of the office on vacation. I set the ProClass 288 to Auto Answer using the front-panel display buttons, without having to fiddle with the host-mode intricacies of my communications program.*

Logbook Entries:

January 10, 1994: *Hooking up the DRM-602X to my DPT SCSI adapter is a snap. The only weirdness: I have to put CDs upside-down into the holders in the six-disc cartridge.*

June 13, 1994: *During a Word session, the first time I click to open a file on any drive, Word insists on loading each CD, one after the other, before it will display the Open File dialog box.*

September 15, 1994: *Microsoft isn't the only company that doesn't know about CD changers. Some programs on CD expect their discs to be in the first slot in the changer—could be a problem if I had two must-have CDs that both want to be number one.*

PHOTOGRAPHS BY JERRY SPAGNOLI



CD-ROM Six-Shooter

CD-ROMs can hold more than half a gigabyte of data, but with humongous video and sound files, one program can easily fill a single disc. Sometimes I feel like I've traveled back to the era of PCs that had only floppy drives, when I had to insert a different disk for each program I wanted to run. What a drag.

Enter the Pioneer DRM-602X CD jukebox. Only about twice the height of a single-disc external CD drive, the DRM-602X lets me load six CD-ROMs at once—the equivalent of up to 3GB of storage. Swapping discs takes only about ten seconds, which is faster than I could do it—not counting the time it would take me to find some CD I'd misplaced.

But I didn't think six slots would be enough. Considering that I wanted to leave at least one of them free to load the occasional temporary CD, that left me with only five slots to be dedicated to specific discs. But either I'm too picky or the nascent CD-ROM market isn't, because so far I've found only two CDs that I want to keep in the Pioneer 602 permanently: Microsoft Bookshelf and the Random House Unabridged Dictionary.

Other people might find six discs too few, and for them Pioneer makes an 18-disc changer. But for the ordinary office and network server, the Pioneer DRM-602X is the best way I've found to end the CD-ROM shuffle. **RON WHITE**

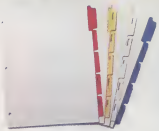
DRM-602X / Pioneer New Media Technologies / (800) 444-6784 / $895 / *Reader Service No. 664*



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A Division of Avery Dennison

Circle 195 on reader service card.


1
2
3
4
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A moveable FEAST.

ADOBE PHOTOSHOP™ 3.0

Here's the recipe. It begins with nine scanned images of restaurants, tables, chairs, a waiter, picture frames and a dinner to die for. Background layer ❶ holds master image. On another layer ❷, sections of two restaurants complete overall scene. Layer Masks are used to hide unwanted portions of image. Wine bottle shadow ❸ is extended using airbrush on Fade setting. Replace Color feature ❹ changes color of wine from red to white. Lighting Effects filter ❺ is used to reduce ambient light and add highlights that reflect multiple light sources. Color Range feature ❻ isolates waiter (originally shot against textured wall), and he is placed in the scene. Mirror images ❼ are copied to multiple layers where they are scaled, composed and further manipulated. Clouds filter ❽ creates window to outside world. Original photographs by Robert Mizono.

Adobe Photoshop, the world's leading photo design and production tool, now offers what everyone has been craving: a banquet of unlimited creative possibilities and remarkable production control. With support for multiple layers, Version 3.0 gives you the freedom to compose and experiment with ease. Add graphics, text and special effects to any layer without altering images on other layers. A redesigned interface with totally customizable floating palettes puts just what you want where you want it. New Lighting Effects, Dust and Scratch removal filters, and Color Range masking are only the beginning of the latest offerings. Improved color production control includes CMYK preview, Gamut Warning, Selective Color Correction and a Sponge Tool that saturates or desaturates color areas. This latest version supports your current operating system on Macintosh™ or Windows™ and even takes advantage of Power Macintosh™ and Windows NT™. A Deluxe CD-ROM is also included. Hungry yet? Call 1-800-521-1976, Dept. L, Ext. 6857 for information and your nearest Adobe Authorized Reseller.



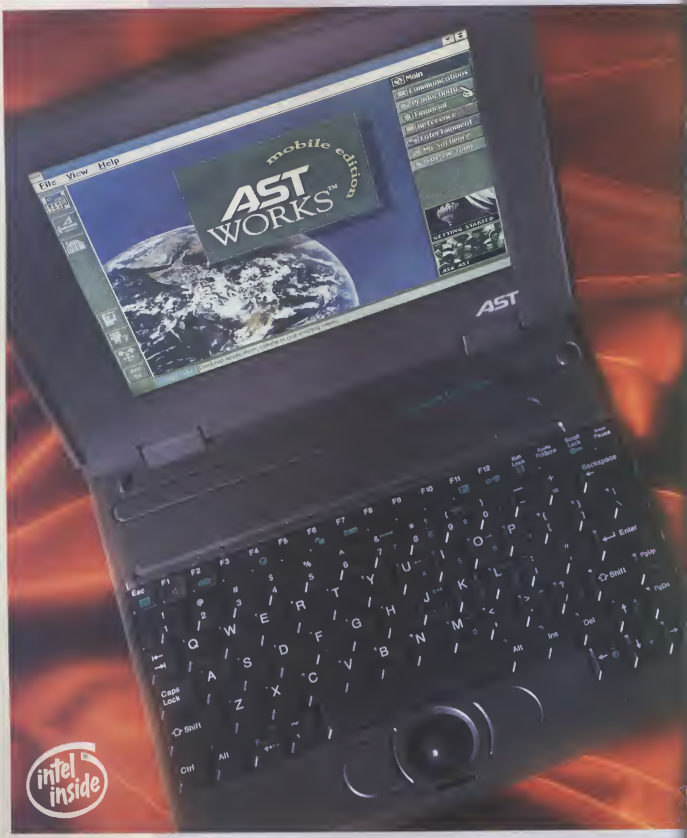
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Adobe

Circle 101 on reader service card.

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If the nineties are about getting value for your dollar, then the Ascentia™ 800N is truly the notebook of the decade.

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New CD Drives: You Ain't Spun Nothin' Yet

CD-ROM In Overdrive

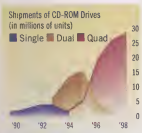
SYNOPSIS

QUAD-SPEED: *The fastest drives have bright futures. Here's where they stand now.* **140**

PORTABLE: *These drives are presentation-ready, but we found trade-offs, too.* **141**

RECORDABLE: *Drives to demystify the science of CD creation.* **142**

FINAL ANALYSIS: *Which of the brand-new technologies actually works?* **152**



SOURCE: FREEMAN ASSOCIATES

Slow Uptake: Drive sales will pick up when quad-ready CDs ship in late '95.

Information is your edge. Monster databases. Applications overflowing with features. Never-ending, megabyte-spending spreadsheets. There is simply no such thing as too much data. This is, sure enough, the information age. And the faster you access data, the greater the edge you have over your competition. For data junkies, CD-ROM was always lust at first sight. Where else can you find 650MB of data for as little as $20? That's about 3 cents per megabyte and a fraction of the cost of the cheapest hard disks.

Like all *affaires des coeur*, day-to-day reality quickly intrudes. CD-ROM technology has had enough limitations to turn any disc enthusiast into an embittered CD cynic. Accessing a CD database on a single-speed drive left us with enough time to have a cup of coffee and finish a crossword puzzle. Creating our own CDs was impossible—ROM means *read-only memory*, remember? And have you ever tried to take a CD on the road? Some of the early portable drives rivaled our notebooks in size.

But that ache in our hearts remains. CD-ROM is still the cheapest convenient way to store data. And, as shown in "Best CDs for the Job" (see page 156), it's no longer a challenge to justify the business benefits of CDs. The good news: Vendors are introducing new types of drives to meet your business needs.

Here, we'll look into the hottest new CD-ROM drive technologies—quad-speeds, portables, and recordables. Quads and portables address your needs for greater speed and take-it-with-you data. We'll show you if the increased speed will really make your life easier, and whether manufacturers' trade-offs make it worthwhile to take your CDs on the road.

There's more. Our most interesting test results came with recordable CD (CD-R) drives. We'll show you what first-generation CD-R drives mean for distributing data—if you can stand some frustration. From reading to writing, it's all here.

BY CHRIS SANDLUND & LIESL LAGRANGE

A READ ONLY? Can writable drives like Yamaha's CDE-100 make you an archiving master and keep data at your disposal with their slick software?

B ROAD-READY: Sexy portable drives like Media Vision's Reno look good, but are they rugged enough to go on the road?

C SO SPEEDY: Quad-speed throughput of 600KBps is enticing, but can NEC's MultiSpin 4X Pro really help apps?

D ANTICIPATION: Will sufficient titles make portables sporting 3.5-inch CD drives, such as Panasonic's CF-V21P, the travel companions of the future?

PHOTOGRAPHS BY STAN MUSILIK


A
B
C
D

Fast Drives, Tiny Packages

Dual-speed CD-ROM drives just weren't cutting it for us. Even though they scorched old single-speed drives, they still slogged through database tasks. And when performance wasn't an issue, portability was: No dual-speed drive that we'd seen looked remotely ready for a 747 fold-down tray or briefcase duty.



4Plex PX-43CH

Verdict: ★★★★

Buffer Size: 1MB
Seek Time: 250ms
SCSI Card: Future Domain

$549; $599 with SCSI card
Plextor
(800) 886-3935
Reader Service No. 666

A little hopeful, we hunted down the state of the art. Would the new quad-speed drives help us get our work done faster? With throughput rates of 600 kilobytes per second (KBps), would they bring out the best in multimedia programs loaded with video, graphics, and animation? Would current CD titles take advantage of this blazing speed and justify the expense? We took a peek at two quad-speed contenders.

We also tested two portable, dual-speed CD-ROM drives. Would their slick portable designs let us use News Electronic Data's Taxi on the road? Did manufacturers sacrifice the power needed for presentations just to make the machine portable?

King Quad Months ago, when we first saw Pioneer's DRM-1804X, we thought: Great performance, but what if you don't need an 18-CD jukebox? Enter Plextor's single-disc 4Plex PX-43CH drive. With performance on par with the DRM-1804X, this internal drive is poised to own the quad-speed throne. Get this: The 4Plex PX-43CH costs only $599.

A whopping 1MB read-ahead buffer and a fast-drive mechanism paced the 4Plex PX-43CH's high performance. Like a diligent student, its cache reads ahead to anticipate which data the CPU needs next. If it already has the data, the cache can immediately send it without reading from the CD again for higher throughput.

The 4Plex PX-43CH is also easy on the CPU, never exceeding 60 percent CPU usage in our tests. Its test results for opening large files, however, were only marginally better than dual-speed drives. This a common problem for quad-speed drives. CD software can't benefit from quad speeds—yet. If quad-optimized discs existed, the 4Plex PX-43CH would have aced all tests.

NEC's MultiSpin 4X Pro has a sleek, sturdy design. Its rotating door protects against dust, and NEC studded the front of the drive with audio controls and an easy-to-read LCD display. It's ergonomically correct, with the power switch up front for handy access.

Too bad the engineers didn't pay as much attention to performance. The 4X Pro had trouble maintaining speed, sometimes dropping down to triple- or dual-speed transfer rates. We particularly noticed the trouble



MultiSpin 4X Pro

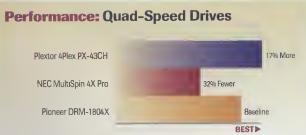
Verdict: ★★

Buffer Size: 256K
Seek Time: 180ms
SCSI Card: NEC

$699
$824 with SCSI card
NEC Technologies
(800) 388-8888
(708) 860-9500
Reader Service No. 667

with smaller files. Lay some of the blame on NEC's SCSI card. We much prefer the Future Domain card shipped with Plextor's 4Plex PX-43CH. That and NEC's $824 price tag made us want to look elsewhere.

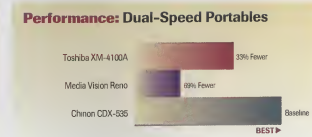
Performance: Quad-Speed Drives



NOTE: FREE CPU CYCLES AT 600K THROUGHPUT WITH MICROSOFT VIDTEST

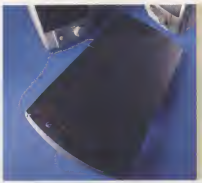
Free Cycles: The CPU load for Plextor's drive never exceeded 60 percent during quad-speed throughput tests.

Performance: Dual-Speed Portables



NOTE: FREE CPU CYCLES FOR AUDIO OUTPUT WITH MICROSOFT VIDTEST

Bottleneck: Portables had fewer free CPU cycles processing audio files. Toshiba's throughput was best in these tests.



Reno

Verdict: ★★★
Buffer Size: 64K
Seek Time: 180ms
SCSI Card: Media Vision Premium 3-D
Weight: 1.0 lb.

$349 with SCSI card
$599 with 3-D audio card
Media Vision
(800) 845-5870
Reader Service No. 668

Performance for Portability? At first glance, Media Vision's dual-speed Portable CD-ROM Player, a.k.a. Reno, looks very hip. Its futuristic shape and dark gray, green, and purple casing could make it the portable of choice for the MTV generation. It's as light as a portable should be, but we shudder at the thought of putting it through our notebook torture tests. We wouldn't want to toss it in an overhead bin, either.

The Reno's overall performance was weak, especially on throughput and CPU utilization tests. Again, blame the SCSI controller. The Reno uses Media Vision's Premium 3-D combination SCSI and sound card. Combining sound and SCSI controllers degrades drive performance (see "Performance: Dual-Speed Portables," page 140). And *portability?* We can see charging extra for a SCSI PCMCIA card, but why not bundle a parallel port SCSI connector.



XM-4100A

Verdict: ★★★
Buffer Size: 64K
Seek Time: 320ms
SCSI Card: Future Domain
Weight: 1.2 lbs.

$415, $570 with SCSI card interface kit
Toshiba America
(714) 457-0777
Reader Service No. 669

Toshiba, on the other hand, built its XM-4100A drive to travel. While we preferred the Reno's top-of-unit control placement to the front-of-unit placement on the XM-4100A, you can toss the XM-4100A in the back seat of your rental car without fear. Because it uses a dedicated Future Domain SCSI card, the XM-4100A bested the Reno in our audio tests. Still, as with the Reno, we wonder how you'll attach the XM-4100A to your notebook without a portable SCSI connection. We weren't taken by the XM-4100A's speed, either. Although it's light and sturdy, we can't imagine lugging the XM-4100A along to a faraway meeting.

FORECAST GET 3GB ON TAP

Spinning Soon

Heard rumors that the CD of tomorrow will be a double-density disc? Try five times today's 650MB capacity. Thanks to shorter-wavelength lasers, better error-correction code, and tighter formatting, we'll soon see more than 3GB on a single CD-ROM. If industry honchos finish the "super" CD specification soon enough, one industry insider claims that demo drives with the new format will appear before 1995 arrives. Expect a transition period similar to the move from 360KB to 1.4MB 5.25-inch floppies. Although your current CD-ROM drive won't be able to read the new disks, production units two years from now will be able to read today's CD titles.

Higher capacities also make portable CDs more feasible. If vendors can fit 3GB on today's 5-inch disks, they can store 1GB on a 3.5-inch mini-CD. With CDs smaller than floppies, expect to see more notebooks like the mini-CD–capable Panasonic CF-V21P.

Bye Bye SCSI For all the industry's Herculean efforts, installing SCSI devices remains a frightening experience for most end users. Vendors including Mitsumi, Panasonic, and Sony continue to ship proprietary interfaces to ensure their drives work properly. Setup ranks as our biggest headache when we encounter a new CD-ROM drive. Fortunately, another CD-ROM breakthrough promises to solve this problem soon.

To avoid SCSI installation hassles and reduce costs, the industry has expanded the IDE interface standard so CD-ROM drives can coexist with a hard drive on the same controller. While SCSI diehards claim that an IDE interface will hamper CD-ROM performance, the Enhanced IDE crowd crows that the only additional cost to add a CD-ROM drive to an IDE system is a $1.50 connector cable. We predict that every system vendor under the sun will have an IDE-based CD-ROM drive in the fall, making multimedia PCs the standard.

On a Different Wavelength Tomorrow's 3GB drives increase their capacity by moving from infrared to the shorter wavelength red laser. With a shorter wavelength, the disc can have smaller pits, tracks can be closer together, and more data can be recorded in the same space. The thinking goes: If a move from an infrared laser to a red one boosts capacity so much, why not continue down the spectrum?

IBM keeps touting an even shorter beam, blue laser. Demonstrated in test labs around the world, blue laser promises 6GB CDs. Don't wait. At least one test system rivals the size of a large table and requires a liquid-nitrogen coolant. Blue lasers may become feasible by the end of the century. For now, you'll have to be content with dreams of a measly 3GB. MARK BROWNSTEIN

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Get It in Writing

There always seems to be one piece of data missing at 5:00 p.m. when you're ready to turn in that overdue memo: last year's expense reports, a client's billings for the life of an account, the networked database you used last fall. Traditionally, these materials get archived (and become harder to find) because most companies don't have the space to keep old data online.

No more. With recordable CD drives (known as CD-Rs), data storage is so cheap that literally any old file can remain instantly accessible. Not only can CD-Rs help you write multimedia discs, they also make online mass storage an affordable reality.

With CD-Rs, you can create a 650MB disc that costs about 3 cents per megabyte. Compare that to a networked 1GB hard drive at 75 cents per megabyte. The only price-competitive solution to CD-Rs is a slow-as-molasses tape drive. And do you really want to wait while a tape drive spools to the end of a cartridge?

CD-Rs have come a long way, but they still aren't perfect—nor are they cheap. That 3-cent figure starts accruing *after* you've laid out at least $2,700 for the CD-R drive. You also could blow your entire capital budget on a CD-ROM jukebox to store all that data.



RCD-202
Verdict: ★★★★★
Record Speed: Single
Buffer Size: 64K
Software: Incat Systems' RCD-PC

$2,695
Pinnacle Micro
(800) 553-7070
(714) 727-3300
Reader Service No. 670

The process of installing a CD-R drive can raise costs further. Productive hours often while away as you hassle with the drive's setup. Many of these systems are combined hardware and software bundles marketed by a single company. If the company does its job right, you'll never notice that the two elements are really from different companies. Unfortunately, too often during setup we found ourselves noticing.

Finally, there's ease of use when creating discs. Because the discs are write-once beasts, creating one is not the same as copying files to your hard disk. First, CD-R programs build a "mirror" (or virtual) CD on the hard disk. Then they actually transfer data to the CD. If you did everything correctly, you've got a new CD. If not, you've ruined a $20 CD platter.

Still, we were sufficiently impressed with the promise of CD-Rs to run eight drives through our tests. At their best, the drives we tested justified our optimism. At their worst . . . well, we're just glad mom wasn't around to hear.



CDE 100
Verdict: ★★★★½
Record Speed: Dual, Quad
Buffer Size: 512KB
Software: Easy CD-Pro 2.11

$5,500
Yamaha Corp. of America
(800) 543-7457
(408) 437-3133
Reader Service No. 671

Crown of the Kingdom We long for the day when all CD-R drives are as easy to set up and use as Pinnacle Micro's RCD-202. Its sleek case encloses a single-speed drive that was one of the least problematic of the units we tested.

But the main reason we stayed out of the manuals was its easy-to-use RCD-PC software, licensed from Incat Systems. Start the program and RCD-PC tiles a File Manager–like window alongside the real File Manager. Creating a virtual image of the CD is as easy as dragging files from File Manager to RCD-PC's window. Add a file by mistake? Drag it back.

Combining the RCD-202 with our slow hard drive proved to be the only drawback. Due to its small 64K data buffer, the RCD-202 hungers for data. Once a faster hard drive was substituted, we were able to keep the RCD-202 well fed with a steady stream of data.

The Right Stuff? Yamaha's CDE 100 proves that it takes more than the right software and a good drive to come up with a great CD-R solution. We were sure we had another winner when we saw the familiar Incat Systems software, customized as Easy CD-Pro. Then we actually started pressing discs.

Don't get us wrong. The CDE 100 is one of the better combinations of CD-R hardware and software.



Personal Scribe 250
Verdict: ★★★
Record Speed: Single
Buffer Size: 512K
Software: Personal Scribe

$4,195
Meridian Data
(408) 438-3100
Reader Service No. 672

One button. One finger. Total control.





Our FlexScan® professional display monitors now include ScreenManager,™* a powerful, on-screen control system that puts all vital image controls at your fingertips. ScreenManager gives you the feeling of a graphical user environment (GUI). All adjustments for color, distortion, sizing, moiré reduction and other functions are easily made by scrolling through a series of on-screen menus with our popular thumbwheel. Setting each individual adjustment is as easy as clicking on a mouse. ScreenManager is another Nanao innovation, and an answer to the growing need for less intimidating technology.



With ScreenManager, Nanao's award-winning family of monitors – featuring ultra high resolutions, sharp edge-to-edge focus, and energy-saving features – are better than ever before. Because they're easier to use. Just think. You don't have to keep looking at your manual for instructions. All the adjustments you need to make are displayed right on the screen. When we developed ScreenManager, we put monitor control right where it belongs – at your fingertips.

*3 Year Warranty***

PCComputing MVP PUBLISHER

Circle 212 on reader service card.

NANAO

Superior In Every Detail

NANAO USA CORPORATION
23535 Telo Avenue, Torrance, CA 90505
(310) 325-5202 Fax: (310) 530-1679
1-800-800-5202

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Even with its boxy design, the CDE 100 flashes enough LEDs to inform you of what it's doing. And its performance was dazzling: dual- and quad-speed recording let us cut a 450MB CD in less than 15 minutes. It was just little things that annoyed us.

We received an error message when we started the software because we didn't have a "hardware key" on the parallel port. Oh. Also, Yamaha technical support told us to make sure the Verify Disk option was *off*. If it isn't, you'll discover a bug in the software. They're supposed to fix this with a future revision, but it's one of those small items that make you wonder how much time hardware manufacturers spend thinking about how software should work.

Split the Difference The only difference we expected when we ordered two CD-R drives from



Personal Scribe 1000
Verdict: ✱✱✱
Record Speed: Quad
Buffer Size: 1.2MB
Software: Personal Scribe

$6,995
Meridian Data
(800) 767-2537
(408) 438-3100
Reader Service No. 673

Meridian Data was their speed. After all, the Personal Scribe 250 is supposed to be a single-speed version of the quad-speed Personal Scribe 1000. Right? Wrong. Meridian markets the drives, but the 250 is manufactured by Ricoh and the 1000 by Yamaha, and we found significant differences between them.

Testing the Personal Scribe 250 went off without a hitch. Thanks in part to the intuitive DOS-based Personal Scribe software, we pressed our first CD 10 minutes after setting up the drive. Our one beef about the software: Give us more built-in tools to check write performance. Our one beef with the Personal Scribe 250 drive: Give us more meaningful LEDs.

The Personal Scribe 1000, on the other hand, gave us more surprises. First we had trouble getting the unit



CDW-900E
Verdict: ✱✱
Record Speed: Single, Dual
Buffer Size: 4MB
Software: QuickTopix for Windows

$6,995
Optical Media Int'l
(800) 347-2664
(408) 376-3511
Reader Service No. 674



PlayWrite 1000
Verdict: ✱✱
Record Speed: Single
Buffer Size: 1.2MB
Software: Dataware's CD-Record

$2,995
Microboards
(612) 448-9800
Reader Service No. 675

to work with our Adaptec SCSI card. The solution ended up being simple, but we looked in vain through the documentation trying to find it. With the new SCSI card, however, the installation routine also added a second MSCDEX line to our CONFIG.SYS file without removing the original. Any CD drive installation routine—CD-R or CD-ROM—should add necessary switches to preexisting MSCDEX settings.

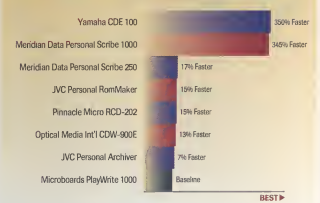
Mirror, Mirror Our favorite CD-R tactic didn't work with Microboards' PlayWrite 1000. When creating virtual CDs, we stored data on the network drive to keep the local drive space free. The PlayWrite 1000's mirror must reside on a local drive—even an external daisy-chained SCSI drive won't do the job.

The single-speed PlayWrite 1000's CD-Record software is an average Windows-based package with a drag-and-drop interface. It switches quickly between various CD formats (such as Macintosh or audio CD). In the end, losing mirroring lost our vote.

Write Only? The QuickTopix software that Optical Media International bundles with the CDW-900E has one of the more confusing Windows interfaces we encountered. First, we had to copy all the files and subdirectories for the CD to our external

Continued on page 151

Performance: CD Creation



NOTE: TIME TO CREATE 4xMB TEST CD COMPARED TO BASELINE SYSTEM'S 1 HOUR, 3 MINUTES, 7 SECONDS.

Coffee Break Authoring: The Yamaha and Meridian Data quad-speed drives minted our test disc in about 15 minutes.


everything IS NEW.
nothing IS THE WAY it WAS.
it's the wake-UP CALL for a NEW way of WORKING.
TIME TO rise and shine.

INTRODUCING 1-2-3 RELEASE 5. NOW THE LEGENDARY SPREADSHEET BRINGS MORE PEOPLE TO THE NUMBERS AND THE NUMBERS TO LIFE.

1-2-3® has always helped individuals become more productive. Now it goes to a new realm—workgroup productivity. With strengthened ties to Lotus Notes® and new, sophisticated routing features, workgroups are using 1-2-3 Release 5 to make decisions, reach consensus and explore possibilities.

No other spreadsheet has the features of 1-2-3 Release 5. Features that make everyday spreadsheet tasks easier. Features that help you move from task to task fluidly. Maximum productivity, minimum effort.

TAP THE POWER OF NOTES WHEN YOU'RE IN 1-2-3. TAP THE POWER OF 1-2-3 WHEN YOU'RE IN NOTES.

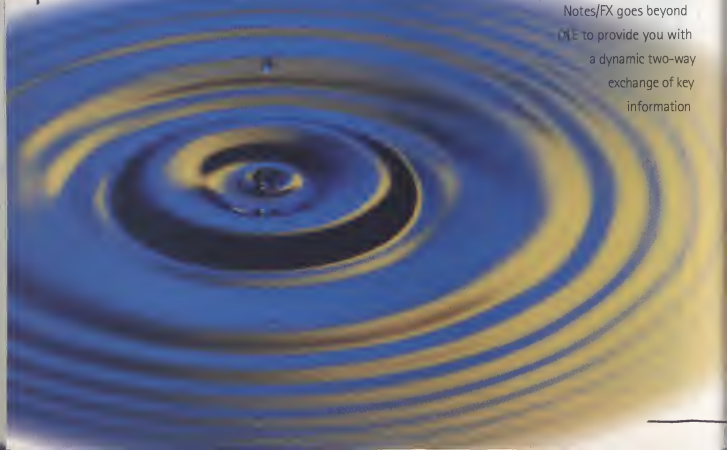
Say you're working on the annual budget in 1-2-3. You can save your spreadsheet in Notes. Then share ideas and information with colleagues working on the same budget at the same time.

Lotus NOTES READY

Any changes to your spreadsheet are automatically synchronized and distributed thanks to Notes replication technology. Plus Notes' security protects the integrity of your data.

When you're working in Notes and want to crunch numbers, prepare budgets or perform "what-if" analyses, you can launch into 1-2-3 with Notes/FX™ 1.1—to get the power of 1-2-3 right in your Notes application. Notes/FX goes beyond OLE to provide you with a dynamic two-way exchange of key information

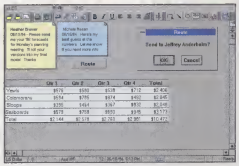
freedom of MOVEMENT, NOT chains of COMMAND.



between Notes and 1-2-3. So you can roll that 1-2-3 information back into any Notes application.

POWERFUL WORKGROUP FEATURES EVEN WITHOUT NOTES.

1-2-3's powerful Version Manager™ lets each person in your workgroup save multiple sets of charts to any name range. So you know the who, what, when and why of every change all the time.



1-2-3's Range Routing lets you share data with colleagues—sequentially or all at once—collecting their comments and input into a single document.

Plus, unlike other spreadsheets, 1-2-3 can designate particular ranges for comment or review by particular users, rather than routing the entire worksheet. Range Routing lets you mail the spreadsheet range to workgroup members for input, track progress, then roll everyone's ideas back into your file, complete with comments and changes tracked as versions.

1-2-3 Release 5 worksheets and ranges can be routed using either VIM or MAPI based e-mail and can be routed either serially or in parallel.

MAXIMUM PRODUCTIVITY, MINIMUM EFFORT.

1-2-3 Release 5 is packed with innovative new features designed to help you get more done with less effort.

SmartMasters™ are predesigned and customizable templates of everyday business forms—like expense reports, invoices and purchase orders—with built-in intelligence to guide you through common tasks in record time. Or create custom SmartMasters for yourself or your workgroup.

With Lotus Maps you can create instant maps of geographic data. Select a range of data and watch 1-2-3 Release 5 create the appropriate map with color-coding based on data ranges. 1-2-3 Release 5 ships with maps for the world by country, U.S. by state, Canada by province, Europe, Mexico, Japan, Taiwan and Australia.

1-2-3 Release 5 features seamless integration with Lotus Approach® database to easily create data entry forms and generate reports and mailing labels.

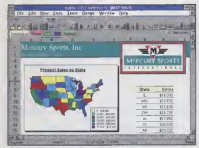
With Fast Format you can apply the formatting you've designed for one range to any other range in the worksheet—with one click of the mouse.



One-Step Charting lets you build a chart complete with labels, titles and legends, all in a single step.

Drag-and-Fill fills in ranges from other documents in just one step. And our improved OLE 2.0 Drag-and-Drop lets you move copy or data across worksheets or files fast.

Multi-page Print Preview lets you view up to nine spreadsheets on your screen before you print.



1-2-3 Release 5 features Lotus Maps. It's the easiest, most effective way to analyze your spreadsheet data geographically.

Taken all together, the new 1-2-3 is loaded with enhancements that make getting the job done a whole lot easier—alone or in a workgroup. And 1-2-3 Release 5 gives you the best compatibility with 1-2-3 for DOS of any spreadsheet. To learn more about 1-2-3 Release 5, visit your Lotus Authorized Reseller or call **1-800-TRADE-UP, ext. A229*** for a free demo disk. A 1-2-3 upgrade costs $119.**

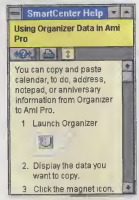
Lotus
Working Together®

NEW SMARTSUITE 3.0. A MAJOR RELEASE TO HELP YOU AND YOUR TEAM WORK TOGETHER.

To work better people need powerful desktop applications, built for both individual and team productivity. SmartSuite® 3.0 is exactly that. It's the best suite for this new way of working because it's the only suite built to optimize Lotus Notes.

The applications that make up SmartSuite have been upgraded in some very important ways—so they work harder and work together better than ever.

1-2-3 Release 5 is packed with new features like SmartMasters spreadsheets templates, Lotus Maps for geographic visuals of data, Smart Assistants to guide you, seamless integration with Approach database, Range Routing for mailing spreadsheet ranges, OLE 2.0 Drag-and-Drop, and, of course, Lotus Notes Integration.



Help Card, one of SmartSuite's powerful help tools, guides you through cross-application tasks.



The new Lotus Approach 3.0 offers unprecedented ease-of-use, PowerClick™ reporting, X10™ technology (our new, exclusive, speed-optimized architecture) and the easiest-to-design forms, mailing labels and cross-tabs on the market.

Lotus Ami Pro® offers powerfully fast word processing (49% faster than Word, 103% faster than WordPerfect®[1]), low memory/hard disk requirements (4MB RAM, 19MB for complete installation), with proofing tools, collapsible click-and-drag outlining, revision marking, powerful macro language and automatic list renumbering. There are over 55 predesigned style sheets for memos, faxes, reports and more. Built-in charting & in-context drawing tools. Ami Pro also seamlessly imports documents from other word processors.

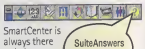
Freelance Graphics® 2.1 features task and industry specific SmartMasters, a unique 3-step process to create presentations, charting and drawing, presentation management and improved import/export capabilities.

And Organizer™ 1.1 offers easy linking for cross-referencing, flexible printing, group scheduling and nifty integration with Ami Pro so you can create monthly calendars in Ami Pro from Organizer appointments.

SMARTSUITE 3.0 IS A BETTER INTEGRATED SUITE ACROSS THE BOARD.

The integration in SmartSuite begins with a consistent look and feel across applications—they share a common user interface, menus, SmartIcons® and a Live Status Bar.

SmartCenter, the headquarters for cross-application services, is always there to help you switch or launch applications. You can customize its icon palette into the configuration that's most convenient for you.



SmartCenter is always there to help you launch applications or switch between them. And Bubble Help is right there for you-all you do is point.

SuiteAnswers are cross-application help tools which include a SmartSuite Guided Tour and task-oriented Help Cards—plus the new ScreenCam™ for creating audio/visual "screen movies." It's the only help service in Windows™ that stays up as you move between applications.

Smart Assistants are your step-by-step guide through common tasks.

And our powerful 1-2-3/Approach database integration lets you analyze and format 1-2-3 data, taking full advantage of Approach's easy-to-use



forms and reports, dynamic crosstabs to pivot rows and columns and tools for creating summaries or viewing data in several formats.

Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. A230*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus NOTES READY

SMARTSUITE, THE NOTESREADY SUITE, EXTENDS THE DESKTOP TO THE WORKGROUP.

SmartSuite 3.0 includes powerful workgroup enhancements. But for an even higher level of workgroup capability, just add Lotus Notes and see what happens:

Combined with Lotus Notes, 1-2-3 Release 5 becomes a model management system that lets team members search a library of worksheets.

Add Notes to Ami Pro 3.1 and it becomes a real "workgroup processor." Use the built-in Notes database for efficient, secure document sharing and tracking. And you can format your Notes or cc:Mail® messages directly in Ami Pro.

Approach 3.0, the top-rated Windows database, becomes a shared reporting, forms and analysis tool. Its advanced integration with Lotus Notes lets you build sophisticated, information-intensive workgroup applications and join Notes data to other types of databases, from dBASE to SQL.

And Freelance Graphics 2.1, used with Notes, becomes a presentation storage system, a library of past presentations, which a team can browse and pull from to create new ones.

For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your

the COMMITTEE IS dead. long live the TEAM.

Lotus
Working Together®

SMARTSUITE 3.0

SmartCenter
(to move between applications)

SmartMasters
(for predesigned templates)

Fast Format
(apply styles throughout documents)

ScreenCam
(to put your ideas in motion)

Smart Assistants
(to guide you)



Configurable Single Install
(for easy one-step installation)

Small Footprint On Your PC
(the most efficient suite available)

1-2-3/Approach Integration
(database power in your spreadsheet)

Lotus NOTES READY

1-2-3 RELEASE 5 SPREADSHEET



SmartMasters
(useful predesigned templates)

Lotus Maps
(geographic visuals of data)

Lotus Approach Integration
(for extra database power)

Smart Assistants
(to guide you)

Range Routing
(for mailing spreadsheet ranges)

Direct Access To Database Files
(open dBASE and Paradox® files directly into 1-2-3)

OLE 2.0 Drag-And-Drop
(move or copy data, with visual mouse cues)

APPROACH 3.0 DATABASE



PowerClick Reportwriter
(for wysiwyg design)

Smart Assistants
(to guide you)

InfoBox
(instant on-screen manipulation)

X10 Speed Architecture
(for blazing speed)

Lotus 1-2-3 Integration
(for working with 1-2-3)

PowerKey™ Technology
(for direct access to existing data)

Dynamic Crosstabs
(for drag-and-drop analysis)

AMI PRO 3.1 WORD PROCESSOR



New Proofing Tools
(for easy document proofing)

Collapsible Click-And-Drag Outlining
(simplifies organization)

Revision Marking
(edit documents without confusion)

New Style Sheets
(more professionally designed templates than ever)

Text Styling
(make your e-mail look better)

WordPerfect Switchkit®
(the move from DOS is painless)

Stick-It Notes
(add comments and messages)

FREELANCE GRAPHICS 2.1 PRESENTATION GRAPHICS



Unique Three-Step Process
(for quick and easy presentations)

One-Click Charting
(access a library of charts and drawings with one click)

Page Sorter
(presentation management at a glance—review and rearrange with ease)

Import/Export
(more file formats than ever—including Harvard/DOS and PowerPoint® 3.0)

ORGANIZER 1.1 PERSONAL INFORMATION MANAGER



Easy Linking
(makes cross-referencing simple)

Flexible Printing
(for your manual planner, mailing labels from your address book)

Group Scheduling
(use with cc:Mail to set up meetings with anyone on your WAN or LAN)

Real Time Access
(instantly view co-workers' busy and free time)

how the NEW SMARTSUITE 3.0 HELPS workgroups work.

The new SmartSuite 3.0. Featuring major new releases of 1-2-3, Ami Pro, Approach database and Freelance Graphics—plus the popular and powerful personal information manager Organizer—this is the ultimate integration of your most important desktop tools. For more information on SmartSuite Release 3.0 and each of the 5 top applications that make up SmartSuite, visit your Lotus Authorized Reseller or for a comprehensive multimedia overview call **1-800-TRADE-UP, ext. A230*** for the free Lotus Product Gallery CD. A SmartSuite upgrade costs $299.††

Lotus Working Together

*In Canada call 1-800-GO-LOTUS. **$119 suggested retail upgrade price. †NSTL, May 1994. ††$299 promotional price available while supplies last. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus, Lotus Notes, 1-2-3, Approach, Ami Pro, cc:Mail, Freelance Graphics, SmartSuite, SmartIcons and Working Together are registered trademarks and ScreenCam, PowerClick, NotesFX, Version Manager, SmartMasters, Organizer, PowerKey, X10 and NotesReady are trademarks of Lotus Development Corporation. WordPerfect and Switchkit are registered trademarks of WordPerfect Corporation. PowerPoint is a registered trademark and Windows is a trademark of Microsoft Corporation. Paradox is a registered trademark of Borland International, Inc.

Continued from page 144

hard drive. *Then* we started QuickTopix and went to work on the data with the mystifying QuickForm. Give us a File Manager–style drag-and-drop interface over a forms-based program any day.

Although the CDW-900E can write at dual-speed rates, the QuickTopix software supports only single-speed CD creation. And don't expect to test your newly minted CD on the drive. It's the only recordable drive we tested that writes but doesn't read. You still need a second drive to read the disc.

Tell It Like It Is JVC's marketing gurus understand the value of CD-R technology. They know it promises to make archiving cheap and accessible. They even named the product Personal Archiver.

We'd have liked the Personal Archiver more if it didn't require a grueling installation process. Manually



Personal Archiver
Verdict: ★★★★
Record Speed: Single
Buffer Size: 16K
Software: Personal Archiver

$2,495
JVC
(714) 965-2610
Reader Service No. 676

editing both the CONFIG.SYS and AUTOEXEC.BAT files turned out to be the easiest of our chores.

JVC's Windows-based Personal Archiver software trails the Incat Systems software used by Pinnacle Micro and Yamaha, but only slightly. Although you use File Manager to create the virtual CD, you can't drag and drop files to Personal Archiver.



Personal RomMaker
Verdict: ★★★
Record Speed: Single
Buffer Size: 64K
Software: Personal RomMaker

$6,695
JVC
(714) 965-2610
Reader Service No. 677

It's not a fatal flaw, though. If JVC cleans up the setup and installation procedures, its Personal Archiver could give Pinnacle Micro's RCD-202 and Yamaha's CDE-100 a run for their money.

We also tested JVC's Personal RomMaker, but we didn't come away feeling it could compete with any of the drives we tested. As an all-in-one concept, the Personal RomMaker heads in the right direction. Its minitower case includes bays for an optional 1GB Seagate SCSI hard disk for CD mirroring and an optional JVC tape drive. Everything you require for CD creation comes in one package.

Unfortunately, the RomMaker software isn't quite there yet. First, we couldn't copy files from network drives and external CD drives. Then, the software's autoconvert feature failed to convert any DOS files that had names beginning with numbers. We advise you to wait for a software update.

SOFTWARE USHERING IN OFFICE **CD-R** CREATION

Specialty Packages Help You Press Your Own

As vendors introduce half-height CD-R drives priced near $1,000 later this year, and the cost of blank discs drops below $12 per disc, "rolling your own" CDs becomes more compelling. But those are hardware costs. The major drawback of CD-R remains its productivity-draining software.

It's infinitely easier to hail a taxi in New York City than it is to create a CD. Getting data onto a disc is not as simple as copying data from a hard disk to a floppy. To make sure you don't fry blank discs (which now cost $20 each), data is preformatted in the particular format read by CD-ROM drives. Most preformatting software creates an image of the CD-to-be on your hard disk, then transfers the image to the CD-R. The more powerful products can slow the hard drive's performance, simulating the relatively slow transfer speeds of CD-ROM drives. If you're planning to create multimedia CDs, be sure to get software that lets you designate data order on the disc. Controlling data placement dramatically improves multimedia CD response.

Although your CD-R drive may have shipped with premastering software, look at the alternatives as well. Like choosing the right communications software for your modem, buying the right software package to go with your CD-R drive could save you time and money.

The growth of multimedia has spawned a cottage industry of products for preparing data *before* it gets to preformatting. Xing Technology's XingCD, for example, creates compressed MPEG files from AVI, BMP, Targa, and standard MPEG files that can be used to create VideoCDs. Although it doesn't work as quickly as the $20,000 to $30,000 dedicated systems used to convert video to VideoCD, XingCD's minimalist $995 price tag can make it an attractive alternative for anyone working with multimedia. **MARK BROWNSTEIN**

Final Analysis: Ready for Prime Time?

Get Ready for Writables

Our tests of cutting-edge CD-ROM drives clocked one winner and two false starts. Recordable CD (CD-R) looks like the best new technology for daily business.

While still not as easy as writing to a hard disk, CD-R is now dramatically cheaper. If you've already been considering a CD-R drive, buy now.

For small-volume disc production, Pinnacle Micro's RCD-202 won our hearts. Yamaha's CDE 100 comes in a close second, but you can't beat the combination of the RCD-202's low price and easy-to-use software.

We still have qualms about some of CD-R's quirks. Check out our Decision Maker (below) to see whether you should consider rolling your own CDs or use a service bureau. Aside from the costs involved, you should put the brakes on a CD-R drive purchase if you lack the necessary staff or plan to produce high-quality multimedia discs. CD-R still requires enough setup and training time to warrant delegating CD creation to one person. And even after getting the basics down, your CD-R expert could spend months learning the intricacies of laying multimedia on CD.

Too Fast, Too Soon? As for quad-speed CD-ROM drives, wait to see how the technology unfolds down the road. No matter what the CD-ROM spin doctors say, there simply aren't enough applications available yet to make the most of the faster speed.

If you're craving speed but money is an object, wait for the prices of quad-speed drives to drop in a year or so. When they cost the same as today's dual-speed drives, you'll spend the money for their marginal performance boost on current applications. By then you should also start seeing the first applications that capitalize on quad-speed CD-ROM technology and, as a result, significant performance improvements.

Paltry Portability We can't recommend hauling either of the portables we tested on the road. Neither product overcomes its manufacturer's performance or packaging trade-offs.

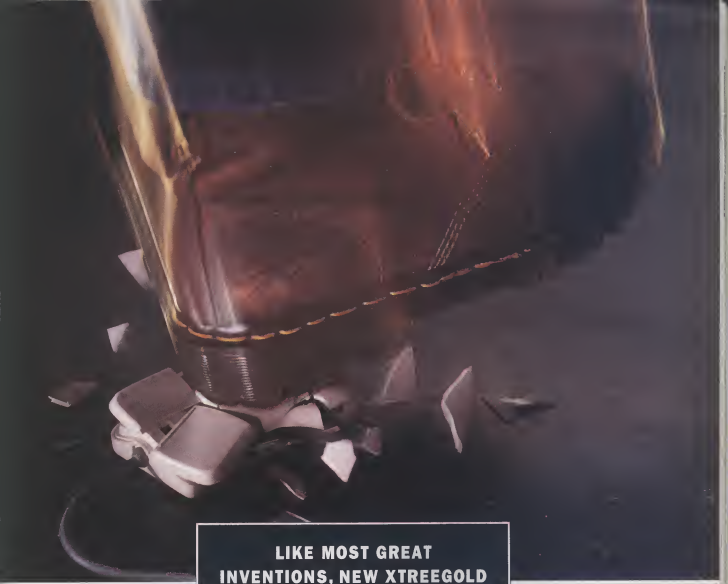
For now, multimedia notebooks—like Texas Instruments' TravelMate 4000M or MPC's CD Book 800—represent the best solution for extended travel with CD-ROM. Although hefty, these notebooks each provide stereo speakers and CD-ROM drives.

Better yet, wait for 3.5-inch disc technology to mature. Panasonic already incorporated a mini-CD drive into its 6.4-pound CF-V21P notebook. The smaller discs currently house 250MB of data. When that number jumps to 1GB in the next couple of years, the mini-CD format will become the standard and portable CD-ROMs will become a reality.

DECISION MAKER — CUSTOM CD PRODUCTION

1 How many CDs will you record?	2 How often do you intend to record?	3 For your needs, you should use . . .
1 to 10	Annually	Service Bureau
	Quarterly	CD-R
	Monthly	CD-R
10 to 100	Annually	CD-R
	Quarterly	CD-R
	Monthly	CD-R
More than 100	Annually	Service Bureau
	Quarterly	Service Bureau
	Monthly	Service Bureau

CD-R Sweet Spot: Press too few CDs and you'll never recoup your CD-R investment. Press too many discs and a service bureau would cost less. At these extremes (more than 100 CDs a year), service bureaus rule. If you fall outside the CD-R sweet spot, contact bureaus like ISOmedia at (800) 468-3939, or the One-Off CD Shops International at (800) 340-1633 to press discs. Bureau prices drop after 100 CDs because one-time setup costs are offset by volume discounts.



LIKE MOST GREAT INVENTIONS, NEW XTREEGOLD FOR WINDOWS WAS BORN OUT OF MILD FRUSTRATION.

The flyswatter. The back scratcher. The commuter lane. And now, XTreeGold™ for Windows. All created by people who'd had enough.

SPEED

In this case, however, the source of irritation didn't come from an itch or a traffic jam. It was a mouse slowing you down. So we found a way to help you avoid the little rodent. And designed XTreeGold for Windows. Now you can manage your files with the keystroke commands you know and love. The same keystroke commands found in XTreeGold for DOS. So you can work the way you like.

But we didn't stop at keystroke compatibility. New XTreeGold for Windows includes over a dozen new features. Like new file viewers for Word v6, Excel v5, and other popular applications. And File Companions, a separate program that provides file management from within Windows applications.

CONTROL

What's more, new XTreeGold is Chicago-ready. it supports long filenames, so when you upgrade Windows you can take your favorite file manager with you.

Had enough? Put your foot down, and your mouse. Call 1-800-240-2279, ext. 403. And let XTreeGold for Windows turn your irritation into inspiration.

CENTRAL POINT

FOR A LIMITED TIME, BUY XTREEGOLD AND GET FREE* CD-ROM SOFTWARE. SEE PARTICIPATING RETAILER FOR DETAILS.

*Requires $9.95 shipping & handling in the U.S.; Canada slightly higher. Good on purchases between Nov. 1, 1994 thru Jan. 31, 1995. Offer valid only thru participating retailers.

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Circle 189 on reader service card.

Six new wa
into mul



1.

The logical way. The Sound Blaster™ Discovery CD™ 16 kit includes everything you need to explore the expanding universe of multimedia. And now it's more affordable than ever. You get a Sound Blaster 16-bit sound card, double-speed CD-ROM, stereo speakers, microphone and 15 cool software titles.
SRP, $349.95



2.

The intelligent way. Sound Blaster Digital Schoolhouse™ is the antidote to mindless video games. It turns an ordinary PC into an awesome educational system that even makes math and spelling cool. Instead of chasing a brainless blip around the screen, kids travel through time to learn about their favorite dinosaurs. Or visit the rainforest or ancient China. Of course, since it's a Sound Blaster, you travel in style. You get a Sound Blaster 16-bit sound card, double-speed CD-ROM, plus 20 of the hottest educational software titles and more.
SRP, $399.95



3.

The take-no-prisoners way.
The most powerful forces of the gaming universe have come together. And now they're coming to get you. Game Blaster CD™ 16 brings together a Sound Blaster 16-bit sound card, double-speed CD-ROM, plus games to die for, like Rebel Assault and SIM City 2000. So be careful out there.
SRP, $549.95

©1994 Creative Technology Ltd. The Sound Blaster and Creative Logos are registered trademarks. Creative OmniCD Compatibility Logo are trademarks of Creative Technology, Ltd. All other trademarks are the property of their respective

ys to blast timedia.



4.

The ultimate way. Educational software, games, cool creative software. The Sound Blaster Edutainment CD™ 16 gives you the whole enchilada. You get a Sound Blaster 16-bit sound card and double-speed CD-ROM. Not to mention over 40 of the planet's most captivating software titles and lots more.
SRP, $599.95



5.

The inexpensive way. The Creative OmniCD™ 2x is the leanest, meanest CD-ROM upgrade in the cosmos. The 2x CD-ROM makes all your software more exhilarating. And it makes you more productive. With 6 cool software titles, you can dive into multimedia right out of the box.
SRP, $249.95



6.

The bogus way. Sure, there are other ways to get into multimedia. But why take a chance? Sound Blaster sound cards and kits are the multimedia sound standard. All the hottest games and software are made to be played on Sound Blaster. Other systems don't seem as real or as cool. And neither do the people who play them.

Of course, all these kits give you 100% Sound Blaster compatibility. And all the technical help you need is just a phone call away. So installation is a no-brainer. Want more information on the mind-expanding world of multimedia? Just visit your nearest Creative Labs dealer. Or call 1-800-998-5227 Ext. 102.

CREATIVE
CREATIVE LABS INC.
WAKE UP THE REST OF YOUR BRAIN™

Sound Blaster Discovery CD, Sound Blaster Edutainment CD, Game Blaster CD, Sound Blaster Digital Schoolhouse and the Sound Blaster holders. U.S. inquiries: 1-800-998-5227. International inquiries: Creative Technology Ltd., Singapore, TEL 65-773-0233 FAX 65-773-0353

Best CDs For the Job

SYNOPSIS

STRATEGY: *What's the most important catalyst for a successful telephone sales call?* **158**

REFERENCE: *Who said, "Business is quite simple. It's other people's money"?* **158**

SCHMOOZING: *Where's the very best restaurant in L.A. to take a vegetarian client?* **161**

MANAGEMENT: *What's the best way to fire someone? To be fired?* **162**

It's taken a while, but the working world is finally discovering that CD-ROMs mean more than fun and games. Their gargantuan storage capacity paired with byte-munching video, animation, graphics, and sound mean business. Interactive tutorials in applications are easier to learn when augmented by video and sound, and those same capabilities bring to life what would otherwise be yawn-inducing business presentations.

CD-ROM technology allows you to have a database on your desk without a mainframe, an expensive online service, or a shelf full of binders—a major blessing for doing a keyword search when you need information ASAP.

Another way businesses are taking advantage of CDs is by loading applications that are impractical in floppy form. Not only do you save disk space, you're spared the drudgery of having to feed countless floppies into your PC to install a program.

Even mainstream applications—word processors, spreadsheets, graphics programs, and financial packages—are jumping on the CD bandwagon, providing utilities and documentation not available in their floppy-based counterparts. See "Bonus Buys" on page 165 for a rundown on the big-name applications you can find on CD, what extras you get with them, and what you'll pay (and perhaps save) for the CD editions.

Don't have a CD-ROM drive? You can find a low-end model for as little as $75, although we suggest investing a few hundred dollars to get a dual-speed drive that will give you more in the long run. It's still pocket change compared to the benefits. And now, here's our look at the ten best business programs on disc.

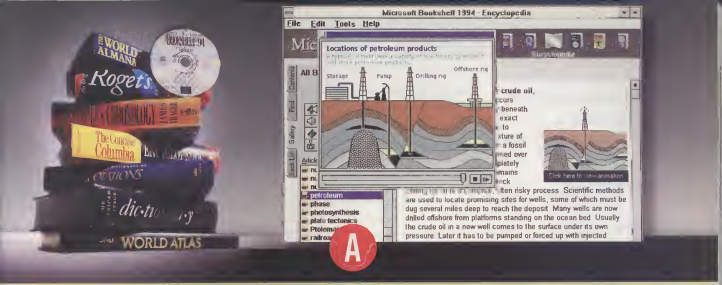
BY RON WHITE

A BOOKWORMS: Think you know all the answers? Then you don't need Microsoft Bookshelf. But it can save the reputations of the rest of us mere mortals.

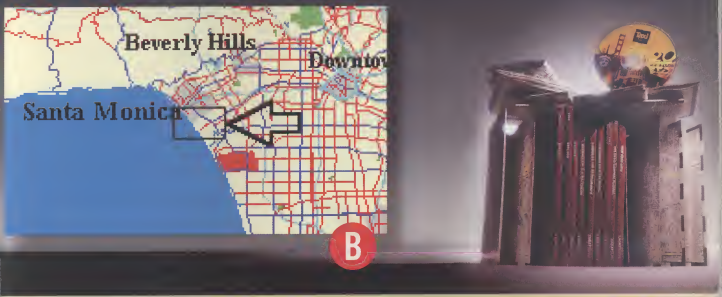
B TOOL AROUND TOWN: If Lewis and Clark had used Taxi, they would have found the Northwest Passage months earlier—or at least a sushi bar in their price range.

C MBA ON DISC: It's a tall order to put more business advice at your fingertips than the 12 books and 3 videos on this CD.

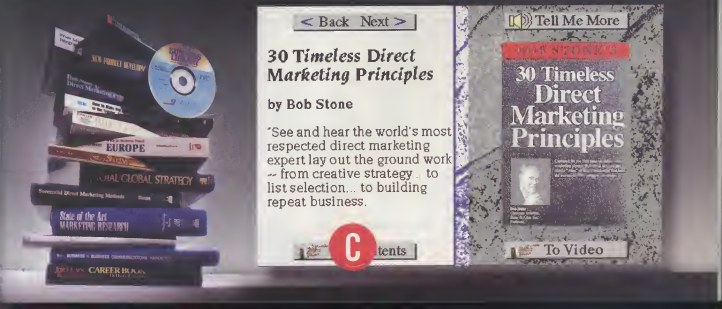
PHOTOGRAPHS BY HEIMO



From Bookshelf's essential reference tools and Taxi's globe-trotting database to the



timeless advice in Business Library, CDs give you the know-how to get the job done.



Best Business CDs: Pocket-Sized Libraries

Business Library Volume 1 ..... ●●●●●



Allegro New Media
(800) 424-1992
(201) 808-1992
$69.95
Reader Service No. 685

In the business world, information is power. The person with the fastest draw on data wins the conference room shootout. Business Library Volume 1 is the Colt 45 around these office parts. This collection of 12 books puts hundreds of facts essential to running a business at your fingertips. What's the best tax advantage you can get on a real estate investment? What customs laws could affect your new export plans? What bright idea can you use as the basis for a direct-mail marketing campaign? The answers to questions like these are just a mouse click away.

Covering business communications, telemarketing, selling strategies, finance, real estate, and international business and travel, this CD includes essential books that every business can benefit from having. There's even one about climbing the corporate ladder. The latest version of Business Library also includes three business videos, as well as a new Windows interface that makes the material easy to search and integrate into your reports, marketing plans, and business correspondence. This disc can mean never having to tell your boss or a client, "Sorry, I don't know that."



Movies for MBAs: Business basics just a click away.

Microsoft Bookshelf 1994 Edition ..... ●●●●



Microsoft Corp.
(800) 426-9400
(206) 882-8080
$79.95
Reader Service No. 686

Microsoft Bookshelf has plenty of savvy no matter what your business, thanks to the wide spectrum covered by its seven reference books: *The Columbia Dictionary of Quotations*, *The American Heritage Dictionary of the English Language*, *The Original Roget's Thesaurus*, *The People's Chronology*, *The Concise Columbia Encyclopedia*, *The Hammond World Atlas*, and *The World Almanac and Book of Facts 1994*. Animation, video, and sound clips have spiced up the books, but the emphasis here is still on that common currency of communication: words.

If the fact, word, map, or inspiration you want can't be found in either Bookshelf or Business Library, you aren't looking hard enough. And in Bookshelf, that's difficult to imagine. A revamped Windows interface makes searches a snap and integrates Bookshelf with your other applications. A separate program, QuickShelf, creates a Windows toolbar that stays on top of your other applications so you can activate the Bookshelf reference materials from within any Windows application.



Snappy Answers: It's faster to scan a CD than a book.

Multimedia Business 500 ..... ●●●

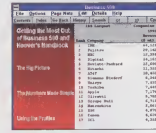


Allegro New Media
(800) 424-1992
(201) 808-1992
$49.95
Reader Service No. 687

Wouldn't you love a corporate spy, someone who could give you the skinny on your competitors and potential clients? Forget wiretaps and hidden cameras—much of the information a spy would get for you is already available in Multimedia Business 500, a collection of detailed data on the 500 largest public and private companies in the country.

The *multimedia* referred to in the program's title consists mainly of Windows videos about the companies and their products. These videos make handy backgrounders—watch one and you'll be able to approach a company with what seems like firsthand knowledge of what it does. A decent search engine lets you find a particular company quickly, and handy onscreen buttons present preconfigured details, graphs, and financial facts so you can quickly see trends.

Multimedia Business 500 does the snooping for you. It provides pertinent, sometimes juicy information on hundreds of companies, from the salaries of their executives to their sales and stock price histories.



I Spy: Snoop without leaving the comfort of your PC.

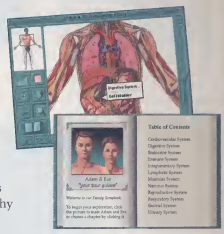
●●●●● *Forget the Harvard MBA. Get this instead.* ●●●● *Sure path to a corner office.* ●●● *You could make your money the old-fashioned way—or use this CD.* ●● *It's a dirty job, but this CD can do it.* ● *Well, better than anything that's* not *on CD.*

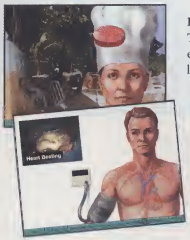
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Windows: 386/33 MHz processor, 486 processor recommended; Microsoft Windows 3.1 or higher; 8 MB RAM; SVGA monitor, 265 colors; double speed CD-ROM drive; MPC-compatible sound card.

Macintosh: 68030/16 MHz processor or higher or Power Macintosh in native mode; System 7; 8 MB RAM; 5 MB hard disk space; 9 inch or larger color monitor, 256 colors; double speed CD-ROM.

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Best Business CDs: Pocket-Sized References

Taxi ●●●●●

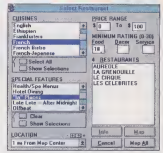


News Electronic Data
(800) 439-8294
(908) 735-2555
$79.95
Reader Service No. 688

Are you a business traveler who has trouble navigating strange cities? A traditional way of getting the scoop on a city is to interrogate those dependable fonts of urban wisdom, taxi drivers. A more dependable way is to interrogate Taxi, a CD packed with intelligent maps of most major U.S. cities, including New York, Chicago, Los Angeles, and San Francisco.

Taxi's maps are intelligent because they're linked to Zagat travel guides, which include detailed appraisals of many hotels and restaurants. Want to take one of your most important clients to a French restaurant with a good wine list and don't care what it costs? Taxi will provide you with a list of all the places that match this criteria—with details on their food, service, and pricing—and show you where they are on a map. It can even show you the best routes to the restaurants from your hotel or your client's address.

Taxi lets you print its maps or copy them to a hard disk so you don't have to carry a



Yo, Taxi! Let this disc be your gastronomic guide.

CD-ROM drive with your laptop when you're on the road. The only thing the program needs is a surefire way to hail a real taxi when it's raining.

PhoneDisc PowerFinder ●●●●

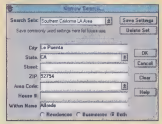


Digital Directory Assistance
(800) 284-8353
(617) 639-2900
$249
Reader Service No. 689

Some businesses live and die by the phone. If you have a permanent crook in your neck from cradling a receiver on your shoulder, you need PhoneDisc PowerFinder. It won't help your neck, but it will help you find any person or business anywhere in the country.

The five-disc set has 91 million residential and business addresses and phone numbers, which can be updated quarterly. If the person you're trying to locate isn't on one of these discs, there's a good chance that he or she hasn't been born yet.

PhoneDisc PowerFinder's information is in the form of databases that you search by name, phone number, street, city, state, zip code, business type, or Standard Industrial Classification number. You can pick a street, for example, and take a cyberstroll down it, seeing which businesses and residences are located along the way. The new Windows interface makes it easier to use than previous versions, and you can export data to popular contact managers and personal information managers. You can even print directly to popular label and envelope formats.



Forget 411: Create and save customized searches.

Government Giveaways for Entrepreneurs ●●●



InfoBusiness
(800) 657-5300
(801) 221-1100
$59.95
Reader Service No. 690

The government taketh, but it can giveth as well. At least that's the gospel according to Matthew Lesko, an enthusiastic pitchman who wrote the CD Government Giveaways for Entrepreneurs as a guide for businesses that want to benefit from government programs. His theory is that if you need some information or advice, chances are someone in the federal government has already researched the topic and come up with an answer. And if what you need is money, the CD tells you how to put in for your share of the grants and contracts lying around just waiting to be claimed by small-business start-ups.

Sound too good to be true? Just watch the video of Lesko admonishing you to take advantage of what your taxes have already paid for—he'll convince you. The CD won't make you rich quick, but it has some of the basic ingredients for people who dream of starting their own businesses. There's even information on how to create a good business plan—something a lot of would-be entrepreneurs can always use advice on.



Lesko's Law: Don't leave your job without his advice.

●●●●● *Forget the Harvard MBA. Get this instead.* ●●●● *Sure path to a corner office.* ●●● *You could make your money the old-fashioned way—or use this CD.* ●● *It's a dirty job, but this CD can do it.* ● *Well, better than anything that's* not *on CD.*

Masterclips: The Art of Business ●●●

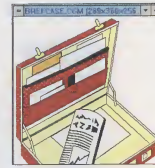


IMSI
(800) 833-8082
(415) 454-7101
$149.95
Reader Service No. 691

There are many collections of clip art on CD-ROM, but the majority of them don't contain images suitable for business use. Masterclips: The Art of Business, on the other hand, is a collection of 6,000 images, any one of which could be used to doctor a marketing plan, spruce up a direct-mail campaign, or add a little extra oomph to an overhead.

The illustrations aren't fancy, which is exactly what's good about them. They can fit tastefully into any business setting and not draw unnecessary attention to themselves. You won't find any cute cartoons of birds or hearts on this disc.

The images are designed to work with all presentation, word processing, and desktop publishing programs, and best of all, the manual contains hard copy of all the images so you don't have to waste time displaying them onscreen. But if you swore off manuals years ago, there's also an impressive Windows search engine to help you find an image online. It's all designed for the businessperson who needs functional illustrations but wants to think about them as little as possible.



Snazz It Up: Clip art you can get carried away with.

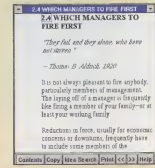
Executive's Factomatic ●●●



Compton's NewMedia
(800) 862-2206
(619) 929-2500
$39.95
Reader Service No. 692

Forget the fact that the name of this CD makes it sound like something you'd expect to find being hawked on cable TV at 1 a.m. Executive's Factomatic provides no-nonsense advice on topics that most people at the top will sooner or later have to confront, from management salary freezes and white-collar crime to restless managers and backlash from affirmative action and office affairs. Don't know which manager to fire first? This disc will advise you. It will even offer a number of suggestions for getting the accounting department and the warehouse in line.

Unfortunately, there's nothing that even resembles pizzazz in this disc. The Windows interface makes it easy to search through the hyperlinked text, but there are no videos, cute animations, or still graphics to sugarcoat the harsh realities that infringe on the executive suite. It's just text and more text, packed with everything you need to know as an executive. But if you've risen that far, hopefully you can take it.



No Frills: Here are the facts every executive should have.

Secrets of Executive Success ●●●

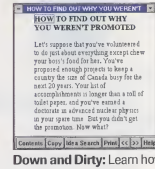


Compton's NewMedia
(800) 862-2206
(619) 929-2500
$39.95
Reader Service No. 693

Executive's Factomatic is fine if you've already made it to the top and are now trying to hang on. But if you're still climbing the corporate ladder, with others nipping at your heels, give yourself a boost with Secrets of Executive Success.

Do the powers that be say you're too young for a promotion? Did they promote someone less experienced over you? Are you feeling burned out? If you answer yes to any of these questions, then you need this CD. It focuses more on how to manage your own career than how to run the office.

Secrets of Executive Success tells you the things they don't teach in business school: how to better control your body language, the unwritten dress code, energizing yourself out of passive mode, how to stop worrying, even how to prevent your presentation from being interrupted by gas (no kidding). If you want an office with a view, or simply an office of your own, then this is the CD for you.



Down and Dirty: Learn how to succeed in your career.

●●●●● *Forget the Harvard MBA. Get this instead.* ●●●● *Sure path to a corner office.* ●●● *You could make your money the old-fashioned way—or use this CD.* ●● *It's a dirty job, but this CD can do it.* ● *Well, better than anything that's* not *on CD.*

If your business relies primarily on contact, you need a telephone with a or headset and a keypad, a shelf full of , a or business card file, something to jot down on and, quite possibly, a to file them away.















Or this.

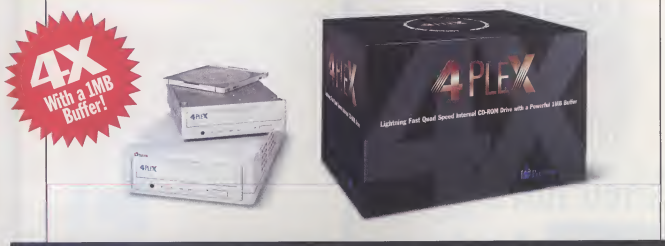
HotLine® for Windows™ is the ultimate telephone management tool. It dials. It creates user-defined phone books. It logs call information and comments. It gives you full-duplex speakerphone capabilities. It lets you call anyone, anywhere, instantly with dBase-compatible directories. Call 1-800-444-SMSI today for more information. It could be the last number you'll ever dial.

SMITHMICRO SOFTWARE

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The Quickest Way for the CD-ROM Revolution to Pick up Speed.



Introducing the 4PleX Quad Speed CD-ROM Drive with a 1MB Buffer.

If you've been waiting for CD-ROM drive performance to really take off, get ready to hold on tight. The new Plextor 4PleX leaps past the capabilities of 2X and 3X drives, and puts you in the forefront of the multimedia revolution. The fastest (600KB/sec) data transfer rate yet seen will whiz multimedia video, graphics and animation across your screen, providing you with realism and excitement that slower CD-ROM drives can't match.

4PleX quad speed drives are available in both internal (standard half-height size for easy mounting in your PC) and external configurations. Both models feature a massive 1MB buffer, the largest ever found on a CD-ROM drive. They connect to your system through a SCSI-2 interface, which offers tremendous performance advantages over the IDE- and ATAPI-interfaces used by many competing drives. 4PleX drives surpass MPC-2 specifications, and are XA and Kodak Photo CD multisession compatible.

Plextor drives are designed for maximum performance and minimum downtime. They are built at an ISO 9002-approved factory in Japan, boast an industry-leading 70,000 MTBF (15% duty), and are covered by a two-year warranty. If you encounter any difficulty installing or operating a 4PleX drive, call our toll-free technical support line, where real people with real answers (CD-ROM is all they do!) will assist you.

Why wait? Join the multimedia revolution with a revolutionary 4PleX CD-ROM drive. Call toll-free 800-4PLEXTOR (800-475-3986) for more information and the name of a dealer near you.



Ask for a free copy of our brochure, "15 Questions To Ask Before Purchasing A CD-ROM Drive"

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Best Business CDs: They Sure Beat Floppies

Job Power Source.....●●●

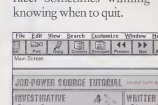


InfoBusiness
(800) 657-5300
(801) 221-1100
$49.95
Reader Service No. 694

So none of the other CDs on this list made your job more enjoyable? Maybe it's time to try Job Power Source, a collection of 11 books and several videos designed to help you find a new job.

The books offer meat-and-potatoes facts and advice, such as which jobs have the most demand for new people, what you can expect to earn in a given job, how to get into an old-boy or old-girl network, and how to write a foolproof résumé. The videos tutor you in the essential job-hunting skills, such as successful interviews and letters.

If you haven't a clue what career you want to pursue, there's also a lengthy questionnaire. By working with it, you may find that you'd be happier driving a cab in Los Angeles than a BMW in the executive rat race. Sometimes winning is knowing when to quit.



Frustrated? Happiness may be a job change away.

BONUS BUYS IF YOU'RE BUYING FLOPPIES, YOU'RE **CHEATING** YOURSELF

Developers often provide extras on CD versions, such as multimedia tutorials, clip art collections, and utilities. What's more, they often charge less for it. Some add only documentation on disc, but that alone can be reason enough to go for the CD version.

Product Information	Extras in the CD Version	Verdict
1-2-3 Release 4 for Windows Lotus Development (800) 343-5414; $495 CD-ROM or floppy *Reader Service No. 695*	Online manual, multimedia SmartHelp tutorial, Lotus ScreenCam (for creating your own multimedia tutorial).	The multimedia tutorials are how all programs should be taught. If you have to teach anything to others, ScreenCam is a great do-it-yourself multimedia tutorial maker.
Arts and Letters Express Computer Support (214) 661-8960; $195 CD-ROM, $295 floppy *Reader Service No. 696*	Multimedia tutorial, additional clip art (including an international gallery of images), two online user guides.	The CD version is $100 less than the floppy package, plus you get a multimedia tutorial and extra clip art. Hard to argue with that, so we won't.
CorelDraw 5 Corel (800) 772-6735; $695 CD-ROM, $895 floppy *Reader Service No. 697*	Adobe Acrobat Reader, Ares FontMinder, 22,000 additional clip art images, 800 additional TrueType and Adobe Type 1 fonts, 150 templates.	You save enough to pay for a CD-ROM drive by buying the CD version, and you get more on the CD than on the floppy. Gee, this is a tough one.
Harvard Graphics 2.0 Software Publishing (800) 336-8360; $395 CD-ROM or floppy *Reader Service No. 698*	Online manual with hypertext navigation tools, 13 additional presentation styles, evaluation option to try before buying.	You don't get that much more on the CD version, but few other mainstream programs give you the same try-before-you-buy option.
Peachtree Accounting for Windows Peachtree Software (800) 228-0068; $169 CD-ROM or floppy *Reader Service No. 699*	Allegro Multimedia Business Library, CompuServe Information Manager, FaxWorks 3.0 for Windows, online manual, 300 business logos.	This is the best bargain on CD that you'll find anywhere. Even if you don't need an accounting program, the extras that come with it are more than worth the price.
Quicken for Windows Deluxe Edition Intuit (800) 624-8742; $69.95 CD-ROM, $39.95 floppy *Reader Service No. 700*	Online documentation, Wall Street Journal Video Guide to Money and Markets, WSJ Personal Finance Library, Tradeline Electronic Stock Guide, 20 government publications.	The *only* thing this lacks is a module to check on fund prices similar to what it has in its stock guide. Even so, this is the most complete package for personal finance you'll find.
Tax Cut Meca Software (800) 820-7461; $39.95 CD-ROM or floppy *Reader Service No. 701*	Sound added to Animated Tax Assistant, context-sensitive videos on tax regulations, full set of IRS instructions.	How often have you done taxes—even on a PC—and wished you could have an accountant whisper in your ear? Now you can.
Word Bookshelf Edition Microsoft (800) 426-9400; $399 CD-ROM only *Reader Service No. 702*	The same stand-alone program that won a place among our top business CDs, extra tools for closely integrating Word with Bookshelf, Word Resource Kit, Word Assistant.	The ultimate writer's package. Combine your words with those of the famous—or at least make sure the words and facts you use are correct.
WordPerfect 6.0 for Windows and DOS WordPerfect (800) 321-4566; $495 CD-ROM or floppy *Reader Service No. 703*	Online documentation.	Come on, WordPerfect! Is an online manual the best you could come up with for a CD? How about technical spelling dictionaries? More clip art? Templates? A measly game?

●●●●● *Forget the Harvard MBA. Get this instead.* ●●●● *Sure path to a corner office.* ●●● *You could make your money the old-fashioned way—or use this CD.* ●● *It's a dirty job, but this CD can do it.* ● *Well, better than anything that's* not *on CD.*

75MHz.



INTRODUCING THE T4800CT. Fasten your seatbelt and enjoy portable multimedia computing in high gear. Race through your number-crunching and graphics-intensive applications on the scorching 75MHz IntelDX4 processor. Load all you want into the massive 500MB hard drive. Enjoy the thrust of an integrated

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- Two PCMCIA slots (16mm and 5mm)
- VL Local-Bus video
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SYNOPSIS

CARD SHARKS: *Fax modems chomp transfer times.* **174**

BUSINESS CARDS: *Network interface cards connect the nomad.* **176**

CARD CATALOGS: *Store up to 170MB of information—at a cost.* **180**

DEALER'S CHOICE: *Neat feats from sound to SCSI to wireless.* **184**

SOCKET TO ME: *Software drivers no longer sputter.* **186**

A GREAT DEAL: *It's safe to stake your money on PC Cards.* **190**

TRUMP CARD: *Dealing with lingering questions.* **192**

Travel without your credit cards? Never. But what if they didn't work in every magnetic-strip reader? You'd leave home without them. That's the way it's been with PCMCIA cards. Great concept—lightweight, portable peripherals. But they've been as unwieldy as their name, dragging incompatibilities along with their assets.

Some cards wouldn't work with other cards' readers. Until now. The current convoy of cards roared through our compatibility tests with a better than 90 percent success rate. Meanwhile, the PCMCIA ruling body voted to hereafter call them PC Cards.

Whatever the name, the concept has always been sure-footed. You can take a notebook from Albuquerque to Zurich and revise budget projections to your heart's content. But how do you send data back to the home office at the fastest rate possible? When you return, how do you connect to your LAN with a minimum of heartache? That's where the tiny, convenient package—the size of either five or ten stacked credit cards and weighing no more than three floppies—comes in. The idea of a universal peripheral slot, enabling you to swap PC Cards among notebooks, PCs, and even high-end workstations, was inspired. The problem: The drivers, called card and socket services, were frequently plagued with incompatibilities. Different services worked inconsistently.

We expected the same compatibility problems when we tested fax modems, network interface cards, hard drives, and several esoteric PC Card peripherals. But were we surprised. We tested 48 cards with the popular SystemSoft card and socket services, and 28 cards with two other vendors' services. The verdict: With few exceptions, it was smooth sailing. Not only can we now pronounce "PC Card," but the technology rolls as smoothly. If you were worried about PC Cards, look again. It's time to break the seal on a whole new deck of cards.

BY CHRIS SANDLUND

A FAX MODEMS: The 19.2Kbps Angia SafeJack outperforms 14.4Kbps fax modems and costs less.

B NETWORK INTERFACE: 3Com EtherLink III takes the prize for performance but not for compatibility.

C STORAGE: The SunDisk Flashdisk roars like a fireball, but its solid-state memory will burn up your checkbook.

D SOUND BUY: They'll cost you more than a desktop alternative, but sound cards like Apex Data's Audio Express are much more fun.

PHOTOGRAPHS BY ROBIN GINSBURG


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SOUND CARD
Audio Express
APEX

Card Sharks

It's the kind of sales trip you dream of—the clients were moved and the order approved. Back at your hotel, your first priority is to send the orders in to the company's computer so the products can be shipped pronto, and then zip back downstairs to celebrate the sale. You once faced a no-win situation—either you used your notebook's internal 2,400-bps modem and listened to your stomach growl, or you carried the latest external 14.4Kbps modem and made a seven-pound notebook even heavier (batteries not included). In this scenario, using a PC Card fax modem means the freedom to take advantage of the latest speed standard, rather than being chained to whatever modem happened to be installed in notebooks when you bought yours.

We sent ten fax modems chomping through tests measuring fax speed and data throughput in both one-way and two-way communications (the latter comes into play when you're using remote access applications and online services). In addition, we ran these card sharks through simulations to see how each of them performed under a variety of phone-line conditions. "Performance: Fax Modems" (at right) shows the combined results of these tests.

In the compatibility tests, the fax modems went ten for ten. In fact, it was the only category where there wasn't a compatibility failure. All of the modems in our tests worked without a problem on each of our fax trials and test configurations, which means wherever you go in the United States, they'll perform for you. Only the one-way and two-way data transfer tests showed differences in throughput: For the most part, cards that excelled in the one-way phase flopped in the two-way phase, and vice versa. We suspect the small PC Card package crimps the vendors' ability to build both these capabilities into their modems.

As was expected, the Angia SafeJack, the only 19.2Kbps modem we tested, bested its competitors in pure data transfer. And next to the fastest 14.4Kbps fax modem, it's a steal. The SafeJack offers a lifetime warranty, with a list price far below the others.

In addition to speed, check to see which fax software is bundled with the card. If it's different from the fax software on your desktop PC, it means learning a whole new application. Also note the connectors you'll be using. Your notebook may have two Type II slots, one on top of the other. Two cards will fit snugly in these slots, and we mean snugly: If your second card also uses a connector of some kind—an Ethernet interface, for instance—you might not have enough space to install both of them at the same time because the connectors will collide.

Performance: Fax Modems



Talk to Me: Angia swept the field in these numbers, which show combined results. We tested them in one-way and two-way data transfer, as well as under various line conditions.

Action Items: FAX MODEM FACTORS

1. **Note the length of warranty.** The way notebooks get bounced around, a two-year warranty for a PC Card isn't enough. Look for a five-year or lifetime warranty.
2. **Don't settle for less than 14.4Kbps.** The exception: If the modems in your host computer are slower and upgrading is beyond your budget, postpone paying for the faster rate on the PC Card.
3. **Note how your application transfers data.** Two-way data transfer capability differs between modems. If you're using remote access software, Lotus Notes, or online services, you'll need this bidirectional capability.
4. **Look at which fax software is bundled.** If your company already uses one kind of fax package, you don't want to have to learn a second application.
5. **Check for compatibility.** When you buy a PC Card, make sure it works with the card and socket services you already have installed. Upgrade to the latest version for best results.

PC Card Fax Modems

Dialing In Becomes a Distinct Delight for Those on the Road

	Compatibility	Warranty	Comments	Verdict
Bullet C1414AX E-Tech Research (800) 328-5538; $299 *Reader Service No. 710*	Passed	2 years	Reasonable price. Among the better performers in our two-way tests.	★★½
DF 14.14 TDK Systems (800) 999-4835; $259 *Reader Service No. 711*	Passed	5 years	Average performance with a great warranty.	★★½
IBM 14.4 IBM (800) 426-2968; $365 *Reader Service No. 712*	Passed	5 years	We like the long warranty and cellular capability, but it's expensive with average performance.	★★★★
Keep In Touch 14.4 AT&T Paradyne (800) 482-3333; $349 *Reader Service No. 713*	Passed	5 years	It's cellular-capable, but expensive. It ties with Hayes's Optima for second place in performance among 14.4Kbps modems but has a much better warranty.	★★★★
Optima 144 Plus Fax144 for PCMCIA Hayes Microcomputer Products (404) 446-6336 (BBS); $299 *Reader Service No. 714*	Passed	2 years	It did well on our one-way tests for data, and tied AT&T Paradyne's Keep In Touch 14.4 for second place in overall performance among 14.4Kbps modems.	★★★½
PCMCIA ST 14.4 Smart Modular Technologies (800) 536-1231; $299 *Reader Service No. 715*	Passed	5 years	Cellular-capable, low price, long warranty—but few points for performance.	★★★
PractiCard 144 Practical Peripherals (800) 442-4774; $349 *Reader Service No. 716*	Passed	Lifetime	A great warranty and cellular capability don't make up for poor performance.	★★★
SafeJack 19.2 Angia (800) 877-9159; $249 *Reader Service No. 717*	Passed	Lifetime	A warranty to die for, and a standout in both one- and two-way tests. Almost any way you slice a purchase decision, this speed demon comes out on top.	★★★★★
WorldPort 14,400 Fax U.S. Robotics (800) 342-5877; $329 *Reader Service No. 718*	Passed	2 years	Vroom! It's the top dog among all the 14.4Kbps modems we tested, and has cellular capability. The comparatively short warranty is extensible for an extra $25.	★★★½
XJ2144 Megahertz (800) 527-8677; $299 *Reader Service No. 719*	Passed	5 years	The snazzy XJack connector is one of the most usable connection units we've seen in a portable peripheral device. But performance was disappointing.	★★★

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Safe Bet: Looking at price and performance, we were bowled over by the Angia SafeJack 19.2Kbps modem. Angia cut its price to $249 so that its speed (19.2Kbps data, 14.4Kbps fax) doesn't cost more. If you need cellular capability, choose the U.S. Robotics WorldPort 14,400 Fax. Whichever you choose, make sure the modems in your host run at the same speed.

PICKS WHICH **FAX MODEM** TO CHOOSE?

1 What's most important to you?	2 Choose the next most important factor	3 For your needs, the best PC Card fax modem to buy is
Performance	Warranty	• Angia SafeJack 19.2
	Price	• Angia SafeJack 19.2
Price	Warranty	• Angia SafeJack 19.2
	Performance	• Angia SafeJack 19.2
Cellular	Price	• U.S. Robotics WorldPort 14,400 Fax
	Performance	• U.S. Robotics WorldPort 14,400 Fax

Business Cards

Your basic budgeting nightmare: keeping your employees both mobile and productive without buying them notebooks as well as desktop PCs. At home or on the road, they need a fax modem to dial in to the server. In the office, they need a network interface card (NIC) to connect to the network. When they're using one, they don't need the other.

PC Cards solve this problem by giving you both kinds of connectivity in one notebook—talk about using business cards for networking. On the road, employees use the fax modem to transfer data. Back in the office, they eject the fax modem from the slot, plug in the PC Card network interface card, and attach to the corporate network. Presto—they've made the right connections.

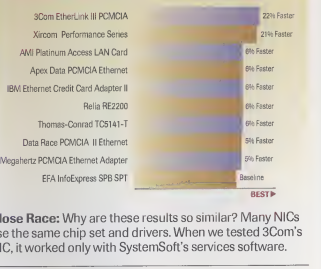
The PC Card network interface cards we tested also eliminate performance headaches for the traveler. To date, the networking alternative has been parallel port devices that severely restricted network throughput. While PC Cards don't match the performance of the hottest ISA network interface cards (primarily because they're still 16 bits, while desktop interfaces have 32-bit capacity), vendors have optimized credit-card NIC performance to the hilt. In fact, among the ten cards we tested, seven were within a percentage point of each other in our network throughput tests.

Of the ten Ethernet PC Cards we tested, only the 3Com EtherLink III and EFA InfoExpress SPB SPT had any compatibility problems. Although they worked fine on our other test beds, the EtherLink III and InfoExpress SPB SPT both failed to work with our Compaq Prolinea using Award Software International's CardWare 2.0. The EtherLink III wouldn't work with the Phoenix Technologies' PCM Plus 3.0 card and socket services until we downgraded to a previous driver (for more on card and socket services, see "Socket to Me," page 186).

The EtherLink III did work with SystemSoft's popular CardSoft 3.1 card and socket services, and it was with those services that it turned in its sizzling performance. It comes with a proprietary enabler, which we removed. In most cases such enablers preclude using other software services.

If you currently use any other card and socket services, check out the new Xircom Performance Series. It's just a shade slower than the 3Com EtherLink III, with the same lifetime warranty.

Performance: Network Interface Cards



Close Race: Why are these results so similar? Many NICs use the same chip set and drivers. When we tested 3Com's NIC, it worked only with SystemSoft's services software.

Action Items: NETWORK INTERFACE NECESSITIES

1. **Don't settle for less than 16-bit data transfer.** Once you're connected, don't let an 8-bit limitation slow you down. Be sure to check for top transfer speed.
2. **Make sure you have the right connectors.** You'll probably encounter both coaxial and twisted-pair media on company LANs. If the card can't autosense which media is attached, skip it. Keep an eye out for new dongles that support both media for maximum convenience.
3. **Match your network operating system.** Support should include, at bare minimum, Novell NetWare, Microsoft LAN Manager, IBM LAN Server, and Microsoft Windows for Workgroups. Windows NT support is a nice bonus, but usually not crucial for a notebook.
4. **Note the length of warranty.** More than performance goes into your decision. Our tests show that performance is the only constant across most of the PC Card network interface cards.
5. **Check for compatibility.** When you buy a PC Card, make sure it works with the card and socket services you already have installed. Upgrade to the latest version for best results.

PC Card Network Interface Cards

Business Cards for Better Networking and Getting Online Faster

	Compatibility	Warranty	Comments	Verdict
EtherLink III PCMCIA 3Com (800) 638-3266; $225 *Reader Service No. 720*	Failed	Lifetime	The fastest of them all, but it comes with a proprietary enabler. It's compatible with only SystemSoft CardSoft 3.1 socket services.	★★★½
Ethernet Credit Card Adapter II IBM (800) 426-2968; $225 *Reader Service No. 721*	Passed	5 years	Nice combination of low cost and long warranty. Average performance.	★★★
InfoExpress SPB SPT EFA (800) 800-3321; $170 *Reader Service No. 722*	Failed	Lifetime	It pairs a lifetime warranty with a low cost, but it's a tad slower than the pack. We recommend it as a baseline performer, but only to the budget-conscious.	★★★
PCMCIA Ethernet Apex Data (800) 841-2739; $239 *Reader Service No. 723*	Passed	5 years	One of the average performers, but blessed with a long warranty.	★★★
PCMCIA Ethernet Adapter Megahertz (800) 527-8677; $259 *Reader Service No. 724*	Passed	5 years	Long warranty meets high cost on the low end of the performance scale.	★★★
Performance Series Xircom (800) 874-7875; $269 *Reader Service No. 725*	Passed	Lifetime	Love that lifetime warranty, but prepare to pay for it. In performance tests, it came in a shade behind 3Com's EtherLink III. It did better than the EtherLink III in the compatibility competition, however.	★★★½
Platinum Access LAN Card American Megatrends Inc. (800) 828-9264; $225 *Reader Service No. 726*	Passed	1 year	The warranty is too short, but the price is right. Average performance.	★★
PCMCIA II Ethernet LAN Adapter Data Race (800) 749-7223; $229 *Reader Service No. 727*	Passed	5 years	Long warranty paired with low cost. Average performance.	★★★
RE2200 Relia Technologies (408) 399-4350; $235 *Reader Service No. 728*	Passed	5 years	Nice combination of low cost and long warranty. Average performance.	★★★
TC5141-T Thomas-Conrad (800) 332-8683; $199 *Reader Service No. 729*	Passed	5 years	Nice low cost with a long warranty, but average performance.	★★★

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Working with Ethernet: Looking at performance, warranty, and compatibility, we liked 3Com's EtherLink III but not its proprietary enabler. A spectacular choice with no compatibility hangups was Xircom's new Performance Series modem. After 3Com and Xircom, the other test results were so close that you might as well go with the EFA InfoExpress for its low price and long warranty.

PICKS WHICH **PC CARD NIC** TO CHOOSE?

1 What's most important to you? **2** Choose the next most important factor. **3** For your needs, the best PC Card network interface card to buy is . . .

Performance	**Warranty**	• 3Com EtherLink III PCMCIA
	Compatibility	• Xircom Performance Series
Price	**Warranty**	• EFA InfoExpress SPB SPT
	Performance	• 3Com EtherLink III PCMCIA
Compatibility	**Warranty**	• Xircom Performance Series
	Price	• EFA InfoExpress SPB SPT

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If you're connecting PCs to a network, scan this chart and you'll see it's time to hook up with HP.

STANDARD NETWORKING FEATURES	HP VECTRA XM2 PC	HP VECTRA M2 PC	COMPAQ DESKPRO/XE	DELL NETPLEX
Advanced Bus Architecture	PCI	VL		
Integrated Networking Interface	32-bit	16-bit		
Integrated, multiprotocol Boot-ROM	X	X		
ISA Plug-n-Play Compliant	X	X	X	
Multilevel Security Features	X	X	X	X
Asset tracking	X	X	X	
PC tattooing	X	X	X	
Optional Desktop Management Software	X	X		
Bi-directional parallel port	X	X	X	X
Desktop Management Interface (DMI)[2]	X	X		

HP quality in value-priced PCs.

- *Intel 33-MHz 486SX, 50- and 66-MHz 486DX2, 100-MHz DX4, upgradable to Pentium Overdrive; Intel 60-MHz Pentium*
- *Chip upgrades to higher performance*
- *On-board accelerated local-bus video*
- *210-MB hard drive[1]*
- *4-MB RAM, expandable to 68 MB*
- *512 KB or 1 MB of Video RAM standard*
- *ISA Plug-n-Play compliant*

High-performance network-ready PCs in a slimline package.

- *Intel 33-MHz 486SX, 50- and 66-MHz 486DX2, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *210-MB, 14-ms Fast-IDE hard drive[1]*
- *32-bit Fast-IDE local-bus hard disk interface*
- *8-MB RAM, expandable to 96-MB*
- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*

High-performance PCs for the connected office.

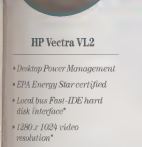
- *Intel 33-MHz 486SX, 50- and 66-MHz 486DX2, 100-MHz DX4, upgradable to Pentium Overdrive*
- *Optional 128- or 256-KB second level cache*
- *Four mass storage shelves; four expansion slots*
- *One available 32-bit VL-bus slot*
- *210-MB, 14-ms Fast-IDE hard drive[1]*
- *32-bit Fast-IDE local-bus hard disk interface*
- *8-MB RAM, expandable to 96-MB*

Exceptional 486 performance for advanced business use.

- *Intel 50- and 66-MHz 486DX2, 100-MHz DX4, upgradable to Pentium Overdrive*
- *PCI architecture*
- *Standard 256-KB second level write-back cache*
- *Four mass storage shelves; four expansion slots*
- *Two available 32-bit PCI expansion slots*
- *210-MB, 14-ms Fast-IDE hard drive[1]*
- *32-bit PCI IDE hard disk interface*

The ultimate PC for advanced business and technical applications.

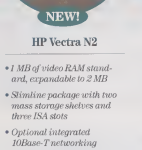
- *Intel 90-MHz Pentium Processor*
- *Second processor socket for MP Spec 1.1 multi-processing*
- *Standard 256-KB second level asynchronous or burst asynchronous write-back cache*
- *PCI architecture*
- *Four mass storage shelves (three front accessible), five expansion slots*
- *Two available 32-bit PCI expansion slots*
- *270-MB, 12-ms Fast SCSI-2 hard drive[1]*



HP Vectra VL2

- *Desktop Power Management*
- *EPA Energy Star certified*
- *Local bus Fast-IDE hard disk interface**
- *1280 x 1024 video resolution**
- *Optional 128- or 256-KB cache memory**
- *Free three-year limited warranty for parts and labor[2]*

from
$1,049[†]



NEW!

HP Vectra N2

- *1 MB of video RAM standard, expandable to 2 MB*
- *Slimline package with two mass storage shelves and three ISA slots*
- *Optional integrated 10Base-T networking*
- *Multilevel security*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)[3]*
- *Free three-year limited warranty for parts and labor[2]*

from
$1,429[†]



NEW!

HP Vectra M2

- *Ultra VGA2 local-bus accelerated video supporting up to 1280 x 1024 resolution*
- *Optional integrated 10Base-T networking*
- *Systems Diagnostics Utility*
- *EPA Energy Star certified*
- *ISA Autoconfiguration utility (Plug-n-Play)*
- *Integrated Desktop Management Interface (DMI)[3]*
- *Free three-year limited warranty for parts and labor[2]*

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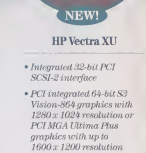


NEW!

HP Vectra XM2

- *8-MB RAM, expandable to 96-MB*
- *PCI Integrated 64-bit S3 Vision-964 graphics accelerator supporting up to 1280 x 1024 resolution*
- *Optional PCI Integrated 32-bit 10Base-T networking*
- *Integrated Desktop Management Interface (DMI)[3]*
- *EPA Energy Star certified*
- *Free three-year limited warranty for parts and labor[2]*

from
$2,069[†]



NEW!

HP Vectra XU

- *Integrated 32-bit PCI SCSI-2 interface*
- *PCI integrated 64-bit S3 Vision-964 graphics with 1280 x 1024 resolution or PCI MGA Ultima Plus graphics with up to 1600 x 1200 resolution*
- *32-bit PCI IDE hard disk interface*
- *8 or 16 MB of RAM, expandable to 256 MB*
- *PCI Integrated 32-bit 10Base-T networking*
- *Integrated Desktop Management Interface (DMI)[3]*
- *Free three-year limited warranty for parts and labor[2]*

from
$3,749[†]





All HP Vectra PCs come with MS-DOS® 6.2 and MS Windows for Workgroups 3.11 pre-installed; HP mouse and keyboard included. *Feature included with some models. †U.S. list price, dealer prices may vary. Monitor not included. [1]Other capacities available. [2]First year on-site, 24-hour service. Second and third year return to dealer. [3]Available 10/1/94. With permission CRN/Benchmark. MS-DOS is a U.S. registered trademark and Windows is a trademark of Microsoft Corporation. Pentium and the Intel Inside logo are U.S. trademarks of Intel Corporation. PPG407 ©1994 Hewlett-Packard Company

Card Catalogs

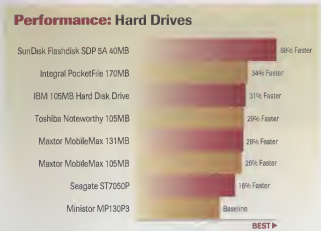
You're ready to hit the road—you've checked a notebook out of the company pool and you've got just about enough time to make the flight without sprinting down the concourse. Suddenly, you realize that you'll need some of the competitive sales information sitting in your 40MB contact-management database. Major dilemma: Start up the file-transfer software and you kiss the plane good-bye, or leave the data behind and kiss the deal good-bye. But what if you could keep your database—as well as other crucial applications and data—on a 100MB PC Card? Check out the notebook, slip in the PC Card, and you're ready for takeoff.

We tested eight PC Card Type III storage drives, first for performance using DOS and Windows benchmarks and then for compatibility. Seven out of eight passed here; Integral's PocketFile 170MB drive worked only with the SystemSoft card and socket services. For comparison, we included a flash disk from SunDisk. As expected, this solid-state storage scorched the mechanical-drive competition in performance. Unlike diamonds, though, silicon does not last forever. After about 400 writes, the flash chips no longer store data accurately. With a price tag of $1,400 for 40MB, flash storage is an expensive luxury.

Finally, we tested for durability. Bang on your average hard disk, and it'll play dead faster than a possum in August. Yet, we regularly toss portable devices around like Frisbees. To see how safe your data will be after all these bumps and grinds, we used a shock tower to push the drives through increasing stress levels. The results destroyed the notions that PC Card hard drives are flimsy. Only one of Minister's two identical drives failed our tests.

These drives are wonders of engineering, and they've got the price tags to prove it. The IBM 105MB PCMCIA Hard Disk Drive costs around $5.50 per megabyte. That's $4.75 more per megabyte than we're used to seeing in a desktop hard drive.

Of the drives we tested, the Maxtor MobileMax 131MB gives you significant storage and reasonable performance at a low price, as well as complete compatibility and durability. When we're stashing our luggage under the seat in front of us, it's the kind of extra storage space we like to have.

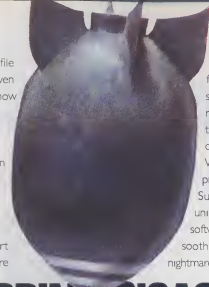


Flash Cards: You may love the performance boost of the SunDisk Flashdisk SDP 5A 40MB, but as a flash disk, it's three times more expensive than the other drives we tested.

Action Items: HARD DRIVE DEMANDS

1. **Don't settle for less than 100MB capacity.** You're going to pay plenty for these devices, so why not get a reasonable amount of storage? Forget our 70 cents per megabyte recommendation for desktop drives. With PC Card storage, try to stay under $4 per megabyte.
2. **Get flash disks for applications with lots of data access.** They're *much* more expensive than rotating media, but flash disks can significantly improve system performance. If your applications constantly read from disk, buy flash disks to avoid headaches—assuming you have the cash. Beware, though—after several hundred writes, their storage capability diminishes.
3. **Create a pool of shared notebooks.** Do the math yourself—you can buy a $400 PC Card drive for each user, which is a lot cheaper than buying each person a $2,500 notebook.
4. **Look for sturdy construction.** Unlike the other devices in this article (and the flash disk), hard drives are mechanical devices, which are much more prone to failure. Look for a shock-resistant case—there is no such thing as a PC Card hard drive that's too rugged. Only one drive we tested failed shock tests.
5. **Check for compatibility.** When you buy a PC Card, make sure it works with the card and socket services you already have installed. Upgrade to the latest version for best results.

If you've ever had hardware problems, file system problems, or even DOS problems, you know that Norton Utilities® is a lifesaver. But we figured it was time to make a great thing even better. And look what happened. InfoWorld gave Norton Utilities a 9.4 out of 10 on its Desktop Utilities Report Card. Suddenly we were teacher's pet. Other members of the press were equally complimentary. Statements surfaced like "the ultimate toolkit for DOS and Windows." And "Norton's new Windows Utilities can assure safer and more reliable computing than anything else on the market." Not something we would just come out and say about ourselves. But Byte and PC Magazine sure did.



"NORTON WORKS WONDERS."

More praise, courtesy of Windows Magazine. But it should come as no surprise. After all, Norton Utilities Version 7.0 was comprised of the best disk-repair and safety utilities on the market. And the critics deem version 8.0 even better.

"THE ULTIMATE TOOLKIT FOR DOS AND WINDOWS."

Like PC Computing Magazine said, Norton Utilities 8.0 works for both DOS and Windows. It has unique Windows utilities for trouble-shooting and repairing the most challenging Windows problems. Such as uninstalling software. Or soothing INI nightmares. All while you're away from your desk. And if it's been one of those days when you can't even stop for lunch, SysWatch,™ Disk Doctor® and Speed Disk™ for Windows can now operate in the background.

"COMBINING PRACTICAL AND FAMILIAR WITH CUTTING-EDGE TECHNOLOGY."

As PC Magazine wrote, we didn't make broad changes to the basic Norton Utilities interface. We combined all the indispensable data rescuers you are familiar with in Norton Utilities 7.0 with new equally impressive diagnostic and repairs tools. And put them in one great package. Reporting memory and resource usage in more detail. Logging all INI file changes so all you have to do is click a restore button.



Peter Norton delivers the only workstation security that won't send your administration costs rocketing out of control.

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PC World put it quite eloquently when they announced to the public, "Norton Utilities 8.0 is absolutely essential for every PC user."

But the most important opinion is yours. Just step on over to your nearest software store today to pick up a copy. Or call us at the number below. And let us know if you think we make the grade.



Norton Utilities received a 9.4 out of 10 on its Desktop Utilities Report Card in the May 9, 1994 issue of InfoWorld.

CALL 1-800-628-4777.

Ask for Extension 9322 to purchase a new version of Norton Utilities 8.0 for just $129.00 plus shipping and handling. (Special pricing for upgrade customers also available.)*

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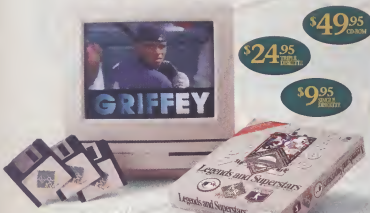
Circle 123 on reader service card.

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* Video on CD-ROM Version only
** Product must be returned for full refund

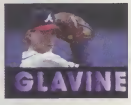














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PC Card Hard Drives

Getting Your Data Together and Taking It on the Road

	Compatibility/ Shock Tests	Warranty	Comments	Verdict
Flashdisk SDP 5A 40MB SunDisk (408) 653-0500; $1,400 ($34.20/MB) *Reader Service No. 730*	Passed/Passed	3 years	Its solid-state technology makes its performance sing, but be prepared to pay dearly for speed. There's also a 20MB version available. Watch out for deterioration of data accuracy after about 400 writes. For mobile applications that need lots of disk access.	****
IBM 105MB PCMCIA Hard Disk Drive IBM (800) 426-2968; $589 ($5.50/MB) *Reader Service No. 731*	Passed/Passed	1 year	It placed second among the rotating drives in our performance testing, but $5.50 per megabyte?	***½
MobileMax 105MB Maxtor (800) 262-9867; $384 ($3.57/MB) *Reader Service No. 732*	Passed/Passed	1 year	You'll pay less for the MobileMax 105MB than for most of the cards we tested, but you'll get slower performance, too. On average, though, a good buy for a middle-of-the-road performer.	***½
MobileMax 131MB Maxtor (800) 262-9867; $423 ($3.10/MB) *Reader Service No. 733*	Passed/Passed	1 year	The MobileMax 131MB has a low cost per megabyte, so given the clustered performance scores, it's a good buy.	****
MP130P3 Minitor (800) 943-0165; $499 ($3.75/MB) *Reader Service No. 734*	Passed/Failed	1 year	Stac Electronics' Stac Anywhere compression software comes bundled, doubling the MP130P3's capacity. However, in our shock testing, one of the two two units we banged on died after 200g shocks. All of the others survived hits up to 500g.	***½
Noteworthy 105MB Hard Disk Drive Toshiba (800) 959-4100; $469 ($4.40/MB) *Reader Service No. 735*	Passed/Passed	1 year	It placed third among the rotating drives in our performance tests, but that doesn't justify its higher cost per megabyte.	***½
PocketFile 170MB Integral (800) 333-8009; $499 ($2.90/MB) *Reader Service No. 736*	Failed/Passed	1 year	Good news: It's the fastest rotating disk card around. Bad news: It's compatible only with SystemSoft's CardSoft 3.1 BIOS. If capacity rather than compatibility is your biggest concern, however, this is the best bet for you.	***
ST7050P Seagate (408) 438-8111; $395 ($9.18/MB) *Reader Service No. 737*	Passed/Passed	1 year	High price, low performance.	**½

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

What's in Storage: Looking at performance, compatibility, and price, we've singled out Integral's PocketFile 170MB for its great results. It worked only with SystemSoft's services software, though, so look at Maxtor's MobileMax if you need great compatibility. For blinding speed, SunDisk's Flashdisk SDP 5A 40MB is the blue streak among our rotating PC Card disks.

PICKS WHICH **HARD DRIVE** TO CHOOSE?

1 What's most important to you? 2 Choose the next most important factor. 3 For your needs, the best PC Card hard drive to buy is . . .

Performance	**Compatibility**	• SunDisk Flashdisk SDP 5A 40MB
	Price	• Integral PocketFile 170MB
Price	**Compatibility**	• Maxtor MobileMax 131MB
	Performance	• Integral PocketFile 170MB
Compatibility	**Performance**	• SunDisk Flashdisk SDP 5A 40MB
	Price	• Maxtor MobileMax 131MB

Dealer's Choice

Even if you love your notebook, you know its limitations. CD-ROM database access—well, no. Network access from conference room or rented car—definitely not. A quick way to transfer data to your desktop when you get home—uh, not really. Well, prepare for a new phase in your notebook relationship. We looked at a slew of new PC Card peripherals that eliminate these drawbacks and bring on a new phase in productivity.

Almost. We have to add one caveat: These are early-adopter products. They can be a godsend if you need them. But prepare for hassles with socket services, even in the latest versions. Worse, you may have to rely on proprietary enablers that will essentially dedicate your notebook's card slot to a single purpose. In these esoteric scenarios, more than anywhere else, we ran into compatibility glitches.



Wireless World: Go with Motorola's Cellect Fax Modem.

But for sheer technolust, these cards are glorious. Say you're in a brainstorming session, typing ideas into your notebook, and you want to access sales reports, drafts of memoranda, and invoices stored on a server somewhere else in the building. Solectek's AirLAN and NCR/AT&T's WaveLAN wireless LAN adapters both provide an unobtrusive way to do so; unfortunately, each requires a proprietary enabler. To their credit, both cards' installation routines warn that they will not work with other PC Cards. Choose the Solectek card if you need to access only networks running Novell NetWare, Artisoft LANtastic, or Microsoft Windows for Workgroups. Choose the NCR/AT&T card if you also need wireless access to networks running Unix, IBM LAN Server, Microsoft LAN Manager, Banyan Vines, or DEC Pathworks.

For a different kind of wireless connection, you can choose cellular fax modems from Megahertz,



Card Stock: Combine Motorola's NewsCard with Hewlett-Packard's 200LX palmtop to download stock updates.

Intel, and Motorola, among others. These handy PC Cards connect to a cellular telephone and let you dial in from wherever you are. No more searching for phones with the proper jacks. Check to see which cards work with your brand of cellular phone. The Motorola NewsCard deserves a look if you have a Hewlett-Packard 100LX or 200LX palmtop. For $229 (cost of the card) plus $62 (monthly cost of the service), you can download data from Hewlett-Packard's StarLink news services. If you need to stay on top of a particular stock or company, it's a handy tool that you can keep on your desk or car seat.

Until we see CD-ROM drives in notebooks, slip in one of the PC Card SCSI connections we tested. With the exception of the AMI Platinum Access SCSI card, which required enablers, the other four SCSI adapters—Adaptec's Slim SCSI, Apex Data's PCMCIA SCSI, Future Domain's SCSI 2 Go, and Qlogic's FastSCSI PCMCIA—all installed flawlessly with the SystemSoft card and socket services.

If you're into multimedia presentations, check out the problem-free sound cards we tested. Although their $399 price tags are a bit steep, two come with sophisticated voice navigation and compression capabilities—New Media's WAVjammer comes with Microsoft's Sound System, while I/O Magic's



Play It Again: Desktop card readers let you transfer data back onto your desktop PC without any hassle.



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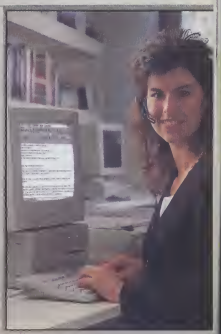
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Tempo Audio Card comes with Voyetra Technologies' own sound system. If you want sound playback only (from a CD-ROM, for instance), go for one of the more basic sound cards, such as Apex Data's Audio Express or Magic Ram's Harmony Card.

I/O Magic also provides the most peculiar card we encountered. Its Focus is a video capture card. We loved the ease of configuration and were willing to live with the limited 8-bit capture. But why would we use it? With camcorders at rock-bottom prices and captured video taking up vast amounts of hard disk space, we'd rather record events on videotape and transfer them to digital back at the office.

When you do get back to the office, PC Card readers simplify using your mobile hard drive. Using an ISA slot on your desktop PC, a PC Card reader acts as an internal drive for transferring data.

SCM's SwapBox Premium bundles SystemSoft and supports two Type III slots; one sits on the card in the back of the desktop so you can easily plug in a fax-modem card and keep the wiring out of the way. The Greystone CardDock's two front-panel Type III slots are easier to access. Hewlett-Packard has already started integrating card readers into desktop systems, and other vendors, such as AT&T, will do so this fall. When desktop readers become common, expect an even wider choice of PC Card peripherals. Simplicity for the mobile user will eradicate the painful early days of PCMCIA.

SERVICES GET THE **LATEST**

Socket to Me

At this time last year, the dream of interchangeable PC Cards seemed to be fading fast. Card and socket services worked poorly between laptops and individual cards, if at all. PC Card vendors, anxious to release working products, shipped cards with proprietary enablers. Unfortunately, these were more reliable than the available card services (the software drivers that physically control the hardware) and socket services (the software that governs how the operating system communicates with the cards and how you can swap them in and out).

What a difference a year makes. This past spring, the three leading card and socket service vendors shipped revisions to their products that actually delivered the holy grail of compatibility. Of the 48 cards we tested with SystemSoft's CardSoft 3.1, 45 worked. Of the 28 we tested for both performance and compatibility using Phoenix Technologies' PCM Plus 3.0 and Award Software International's CardWare 2.0, 26 worked.

Some PC Cards still require a proprietary enabler—a solution that only works with one card. Eject that card, try to swap in another, and you're out of luck. You'll have to reconfigure your system and reboot. Upgrade to and stick with the latest revisions of card and socket services.

Where the Wild Cards Grow

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Maxtech
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$249
Reader Service No. 739

MobileMax Desk Runner
Maxtor
(800) 262-9867; (408) 432-1700
$143
Reader Service No. 740

SwapBox Premium
SCM Microsystems
(408) 395-9292
$269
Reader Service No. 741

TMB-250
Databook
(716) 292-5720
$299
Reader Service No. 742

SCSI Connectivity

FastSCSI PCMCIA
Qlogic
(800) 867-7274; (714) 438-2200
$215
Reader Service No. 743

PCMCIA SCSI
Apex Data
(800) 841-2739; (510) 416-5656
$339
Reader Service No. 744

Platinum Access SCSI
American Megatrends Inc.
(800) 828-9264; (404) 263-818
$275
Reader Service No. 745

SCSI 2 Go
Future Domain
(800) 879-7599; (714) 253-0400
$348
Reader Service No. 746

Slim SCSI
Adaptec
(800) 934-2766; (408) 945-8600
$349
Reader Service No. 747

Sound and Video

Audio Express
Apex Data
(800) 841-2739; (510) 416-5656
$399
Reader Service No. 748

Focus Video Capture Card
I/O Magic
(714) 727-7466
$599
Reader Service No. 749

Harmony Card
Magic Ram
(800) 272-6242; (213) 413-9999
$295
Reader Service No. 750

Tempo Audio Card
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WAVjammer
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$399
Reader Service No. 752

Wireless Communications

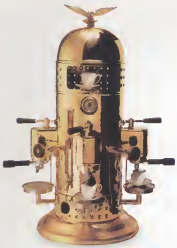
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Cellect Fax Modem
Motorola
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$449
Reader Service No. 754

NewsCard
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$229 (messaging service $10-$62)
Reader Service No. 755

PCMCIA Cellular Fax Modem
Megahertz
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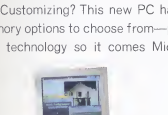
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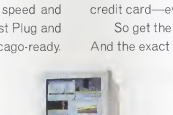


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- *Bus: PCI/ISA*
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- *Slots: 1 ISA, 1 PCI/ISA, 1 PCI*
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- *RAM: 8MB to 128MB*
- *Secondary cache: 256KB to 512KB*
- *Hard disk: 540MB*
- *Slots: 3 ISA, 1 PCI/ISA, 1 PCI*
- *Graphics: S3 864 with Hawkeye drivers*
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A Great Deal

Unlike the lovers of technology for technology's sake, business users demand that products work the first time out of the box. If a product is going to supplant the current kludgy solution, it better do so right away. Practical businesspeople won't suffer with a technology just because it's slick. Like operating systems that kick out the kinks only after multiple revisions, PC Cards have just recently cleared the major hurdle to business PC acceptance with the release of new drivers last spring. Could it be coincidence that the Personal Computer Memory Card Industry Association changed the name of its standard to PC Card around the same time?

Whatever the reason, it's cause to celebrate, because PC Cards are a godsend. With card and socket services from SystemSoft, Phoenix, or Award, you can swap devices in and out of your notebook at will. Only have a single Type III slot? Simply eject the Type II modem that's taking up half the space and install the Type III hard drive. No system crash. No reboot. When technology gets this simple, the options start multiplying.

By the end of the year, expect to see more PC Card–equipped desktop units. Vendors dragged their feet as long as PC Cards worked better in theory than in practice. The addition of card readers is a loud vote of confidence for PC Cards.

The final issue desktop vendors need to resolve is whether to mount the drives on the front or the back of a desktop PC. The add-on card readers we reviewed used both methods. Even though connectors dangled out the front of the PC, we prefer the accessibility. The primary use of PC Cards in the desktop will be to move data back and forth from a notebook. Having a drive slot in the front of a chassis turns Type III hard drives into extremely large—albeit expensive—floppies.

When you're on the road, the size and weight of PC Cards is paramount. When your briefcase is filled with a notebook, a power adapter, tickets, and other paraphernalia, you'll run screaming if your boss asks you to schlep an external modem along. PC Cards save space and your shoulder.

Slightly larger than a stack of five credit cards, a Type II PC Card easily fits into a briefcase pocket. The reduced size of computing components lets you



Road Trip: While saving lots of space, PC Cards have matured into reliable traveling companions.

Making the Right Connections

Check Your Notebook to Make Sure You Can Play the Slots

Notebook Application	PC Card Options for Your Notebook Configuration		
Fax Modems (Type II)	**One Type II slot** accepts one Type II fax modem card at a time. Fine if you don't need to swap cards a lot.	**Two Type II slots** accept two Type II cards simultaneously. Even though the slots look like they can accommodate a 10.5mm Type III card, the internal connectors will not match.	**One Type III slot** accepts two Type II cards. The Type III slot is 10.5mm, so you can insert two 5.25mm Type II cards.
Network Interface Cards (Type II)	**One Type II slot** accepts one Type II network interface card at a time. Leave it in for easy network access when you're back at your desk.	**Two Type II slots** accept two Type II cards simultaneously. Even though the slots look like they can accommodate a 10.5mm Type III card, the internal connectors will not match.	**One Type III slot** accepts two Type II cards. The Type III slot is 10.5mm, so you can insert two 5.25mm Type II cards.
Hard Drives (Type I and Type III)	**One Type II slot** accepts one Type I RAM card only.	**Two Type II slots** will accept two Type I RAM cards. They will not accept a Type III card.	**One Type III slot** accepts one Type III card as if they were made for each other. One Type I fits, too.

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"Its ability to plug-away through poor line conditions puts it in a whole new league." Computer Shopper, July 1994

1st Place – PC Computing, *"Great bundle with bargain price–our winner was a favorite with testers."* **June 1994.**

★★★★ – MACWORLD, *"Supra is paving the way for life in the fast lane."* **August 1994.**

Circle 137 on reader service card.

Final Analysis: It's in the Cards

take more along to remote offices. When you stay connected both on the network and via modem, you increase the amount of information you can access. And better data means better and faster decisions.

Having access to more data helps, too. The biggest PC Card hard drive we tested, the Integral PocketFile 170MB, holds 170MB of data. Its Type III form factor is 10.5mm—twice the height of the Type II form factor—and the PC Card hard drive weighs no more than a handful of floppy disks. That's a lot of data to work with in a small space. Most of the others tote at least 100MB.

PC Cards have not yet dealt us a royal flush, though. We still recommend you steer clear of proprietary enablers. A throwback to the bad old days, proprietary enablers put all the hassles back in PC Cards. The few stragglers who still rely on enablers should fold their hands and bet on the upgraded card and socket services for their users' sake.

We think the promise of PC Cards has been delivered: A surprising 93 percent of the cards we tested with all three services passed our compatibility tests. While you don't have to worry as much about compatibility problems, you still have to be aware of exactly what kinds of cards you can use in your notebook slots (see "Making the Right Connections," page 190). While one 10.5mm Type III slot can accept two 5.25mm Type II cards, it doesn't work the other way around. Two 5.25mm Type II slots can't accept one 10.5mm Type III card. Check the table to see which cards fit in which slots.

When you buy your next notebook, keep in mind what applications you'll be running, because this will directly affect the kind of slots you need. There should be a plethora of choices: Within three years, according to Dataquest, 100 million PC Card slots will be available, covering form factors of all Types.

What's even more encouraging about our test results, though, is that a mature PC Card standard will bring out the creativity in card designers everywhere. With products such as PC Card–based Global Positioning Satellite readers just around the corner, can more productive applications be far behind? When these new devices finally ship, you'll be able to slide them in, wait for the beep, and be confident they'll perform.

Worth the Wait: Plugging In the Trump Card

1. **Card and socket service** providers have solved compatibility problems with the latest upgrades.
2. You'll pay more for PC Card peripherals, but their **portable convenience** is worth it.
3. With card and socket services built in, Windows 95 will make PC Cards even **easier to use.**

Still wondering about how well PC Cards' can meet your daily business needs? Don't. If you're ready for mobile computing, there's a PC Card designed to help you.

Doesn't incompatibility make PC Cards a risky investment? No longer. After last spring's revisions to card and socket services from SystemSoft, Phoenix, and Award, 93 percent of the products we tested worked. As long as you avoid proprietary enablers, you'll find compatibility problems have effectively disappeared.

Aren't PC Cards expensive? Sure, Type-III hard drives are significantly more expensive than internal drives. You're looking at prices of $3 to $5 per megabyte rather than 75 cents per megabyte. Yeow! PC Card–based 14.4Kbps fax modems can cost $100 more than traditional modems. Ethernet adapters that cost virtually nothing in ISA form cost several hundred dollars in a Type II format.

We suffer downsized keyboards and inferior display technologies in our notebooks, and still pay more for them than we would pay for desktop PCs. But how do you measure your ability to be more productive on the road? With PC Card peripherals, you pay for portability the same way you did when you bought your notebook.

Can I buy Type IV form factor cards? No. Toshiba built a 14.5mm slot into its notebooks and called it Type IV, but that form factor was not approved by the PCMCIA Association. You'll find 14.5mm slots in some Toshiba notebooks, into which you can put Type I, Type II, and Type III cards. Only Toshiba makes hard drives and modems that are 14.5mm for this proprietary form factor, and at the Association's insistence, they don't refer to it as Type IV.

What happens when the next version of Windows ships? Upgrading an operating system usually destroys an emerging standard. Not so with PC Cards. Microsoft purchased code from SystemSoft to make sure the next version of Windows will have basic card and socket services built in. As SystemSoft has the most widely supported card and socket services, you can expect Windows 95 (formerly known as Windows 4.0 or code-named Chicago) to work with most of the products currently on the market. We expect that the final Microsoft implementation will make card and socket services compatible with Plug and Play. When you boot up with a PC Card peripheral installed, the new Windows will automatically load the correct driver.

From what we've seen so far, however, you'll get what you pay for. There will still be a place for card and socket service vendors to add value. In particular, Microsoft's efforts to make Plug-and-Play capabilities ubiquitous opens the door for service vendors to develop software that does more than just load drivers. Look for slick, mobile applications that won't make you feel like you're getting a raw deal.

The only thing missing is the wait.



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SprintScan 35 scans slides at 2700 dpi in under a minute.

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* Source: Evaluations by Rich and Associates, June 1994. † Suggested list price. Actual purchase price may vary. "Polaroid" and "SprintScan" are trademarks of Polaroid Corporation.

Circle 204 on reader service card.

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Circle 233 on reader service card.

Upgrades That Pay

SYNOPSIS

MEASURING ROI: *Use our formulas to calculate your own return.* **198**

MONITORS: *Bigger is better, some workers prove.* **200**

CPUs: *Here's a productivity boost that's easy to cost justify.* **202**

MEMORY: *You and everybody else will benefit from this low-cost upgrade.* **208**

SITE STUDY: *How one company's memory upgrades saved time for its clients.* **210**

FINAL ANALYSIS: *Strategies for justifying technology upgrades.* **214**

You always want more, don't you? You can feel in your bones that you'd be more productive with your PC if only you had a bigger screen, a faster processor, more memory. But your company's system standards allow only 2MB of RAM—never mind that Windows runs like a snail . . . . When you submit a purchase order for a bigger monitor, the comptroller says if he can get by with a 14-inch screen then so can you. Every time you go to cut the check for that Pentium machine, some financial crisis takes priority and your upgrade is postponed for another quarter. If only you could cost-justify the payoffs and prove your point.

Well, here's some ammunition for you: With the help of *PC Computing*'s Usability Labs, we measured the potential productivity gains you get with certain key upgrades. In some cases, we found that productivity increased by double-digit percentages, and the purchases paid for themselves in a matter of weeks. Your return on investment (ROI) varies with the type and amount of computer use. But in most cases, the numbers should be convincing to the most scroogish of companies, comptrollers, or consciences. In fact, *not* upgrading may be financial folly.

In our Usability Labs, we tested three common (and unrelated) upgrades for time saved and satisfaction gained. We measured the advantage of upgrading from a 14-inch to a 17-inch monitor. We charted the effect of upgrading microprocessors from a 386 to either a 486 or a Pentium. Finally, assuming that a typical memory configuration in a business machine is still 4MB, we tested the impact of upgrading to 8MB and 16MB.

Our goal? Find out just how much productivity workers stand to gain during computer tasks typical of three kinds of jobs: administrative assistant, number cruncher, and manager.

We made several assumptions in our calculations about these typical workers, their tasks, the number of hours per day they use

BY RON WHITE

A MONITORS: Depending on your work, a 17-inch monitor can save you upwards of five hours a month and pay for itself in as little as four and a half months.

B PROCESSORS: A system upgrade can increase productivity by double digits and pay for itself in just a few months. All three types of workers we tested benefit from this upgrade.

C MEMORY: Most workers will benefit enough from a memory upgrade to pay for it in less than a month, while reclaiming as many as 310 hours a year.

PHOTOGRAPHS BY MARK JOHANN



Look Closer: The advantages of a monitor upgrade depend on the tasks you do.



Don't Wait: System and memory upgrades show immediate returns.



a computer, and their hourly pay. We didn't consider interest rates, training costs, personnel issues, depreciation, or other economic factors that could vary widely. Your situation may not fit our model perfectly, but you can probably find an approximate fit for you or your employees.

By downloading our formulas and productivity results from PC Contact (see page 262 for instructions), you can easily customize these values to your own situation. Our results will give you cold, hard ammo you can use to storm into your boss's office and declare, "You donkey! Don't you know we could be 10.4 percent more productive if you'd just sign this purchase order? Here! These numbers prove it!"

Even if the ROI argument isn't compelling, there are other important reasons to upgrade. Job satisfaction, increased accuracy, and better service to your customers are just some of the yardsticks you might use to measure increased employee performance.

An important caveat: The potential for solid financial payback doesn't automatically mean you'll see improvements in productivity, of course. Saving time can mean more work gets done or that employee workloads finally fit into a 40-hour week. But it could also result in a rise in coffee breaks and Tetris-playing.

Measuring ROI We began our CPU tests with a common older configuration—a Compaq Deskpro with a 20MHz 386SX processor, 8MB of RAM, and a 14-inch NEC MultiSync 2V monitor running off a VGA display card. Our memory tests began with a similarly configured 33MHz 486 Compaq Deskpro 433i with 4MB of RAM. For the monitor tests, we added 4MB of RAM, for a total of 8MB, to the 486 system. These systems would have been state of the art only a few years ago. Today, their monitors, processors, and RAM are rife with bottlenecks to productivity.

We calculated the value of the time saved as the workers completed their tasks and compared it to the costs of the upgrades. Because we wanted to emphasize speed and ease of use for each hardware configuration, we chose six experienced PC users as testers.

The administrative assistants created a letter, performed a mail merge, and backed up a directory. They also updated an employee newsletter by cutting and pasting images, and printed out the finished version.

The number crunchers created a travel expense report; added an employee to a database, which they then resorted; and combined two spreadsheets into one. They then used the spreadsheet to build a graph, and cut and pasted information for a memo.

Managerial testers set up a meeting by opening mail, reviewing meeting requests, and checking an online schedule. They embedded a video file into a document, filtered a customer database to find a specific set of contacts, copied the database into a spreadsheet, and modified an existing presentation.

The Hard Numbers Our ROI formulas were based on real-world wages and hours of work-related computer use. We assumed that administrative assistants earn $13.50 an hour and use a PC for 100 hours each month. Number crunchers earn $40 an hour and use a PC for 140 hours a month. Managers earn $50 an hour and work 60 PC hours a month.

Our results were enlightening. Upgrades that increased productivity the most didn't necessarily earn the fastest payback. And some upgrades to the cutting edge that benefited everyone generated slower paybacks than less expensive upgrades. Most important, you can't assume anything without factoring in the kind of work being done on the computer you're upgrading.

ADD IT UP TO FIGURE YOUR **PAYBACK**, PLUG YOUR NUMBERS INTO OUR FORMULAS

How We Measured the ROI of Upgrading

We used the following formulas to calculate the payback gained from upgrading a system's monitor, CPU, or memory. To assess a rate of return specifically tailored to your circumstances, combine our test results with your hourly wage and the number of hours you use a PC each month for specific kinds of tasks. The result is your payback schedule.

These formulas are also available in Excel 4.0 or Lotus 1-2-3 Version 2.01 format as PAYBAK.ZIP in data library 2 (Templates/Macros) of PC Contact. See page 262 for downloading instructions.

Our calculations depend on correct figures for the following terms:

Cost: The price of the upgrade. You can use our street prices (download PCSTRT.ZIP from data library 2 of PC Contact) or substitute your own figures.

Hours You Use a PC: The number of hours you use your computer per month. Our calculations are based on relatively heavy PC use.

Salary: Use your salary to calculate your hourly pay rate.

Productivity Increase: The time it takes to do a task with an upgrade divided by the time it takes to do the same task without the upgrade. You can conduct your own tests or use the productivity increases determined by our testing for the type of tasks that most closely match your own.

ROI Formulas

Time for Upgrade to Pay for Itself:
Time = Cost ÷ (Hours You Use a PC x Salary x Productivity Increase)

Payback after One Year of Use:
Payback = −1 x (Cost − (12 x Hours You Use a PC x Salary x Productivity Increase))

Productive Hours Gained after One Year:
Hours Gained = 12 x (Hours You a Use PC x Productivity Increase)

PC Contact

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Circle 126 on reader service card.

The Big Picture

There's a luxury to bigness—the comfort of an overstuffed chair compared to a kitchen stool, the expansiveness of a Lincoln Town Car compared to a Ford Pinto, the power of a heavyweight champ compared to a flyweight.

But if you're talking about a PC monitor, does bigger mean that you'll get more work done or get home sooner? The definitive answer is . . . sometimes. All of the *PC Computing* Usability Labs testers liked using the 17-inch monitor, but our test results show that the real advantages depend on the type of work you do.

We swapped NEC's MultiSync 5FGe 17-inch monitor for the original 14-inch display. Because the payoff comes from cramming more onto the larger screen, we also changed the resolution from VGA to 1,024-by-768-pixel Super VGA. We calculated the street cost of a 17-inch MultiSync at $1,000 plus $200 for a Super VGA card to provide the higher resolution.

The testers doing typical administrative assistant tasks rated their satisfaction with the 17-inch monitor only slightly higher than that for the 14-inch monitor. And, in fact, they gained only a modest 3 percent improvement in performance during a variety of tasks. At the administrative assistant salary, it would take more than two years to pay for the monitor.

Task Productivity The managers, on the other hand, got a 9 percent productivity boost, due mostly to the ability to move among more onscreen windows. Because managers tend to spend less time in front of their screens, the 9 percent translated to a time savings of 64.8 hours a year—or 5.4 hours a month—not much more than the administrative assistants' time savings of 3.4 hours per month. But—this is where it counts—the managers' time costs much more, so the monitor pays for itself in four and a half months. In a year of use, the monitor could potentially increase each manager's productivity to the tune of $2,020—a return of 168 percent on the $1,200 investment in the larger monitor and Super VGA card.

The usability testers' comments echoed our numeric results. Compared to one administrative assistant's tepid endorsement of the larger monitor, a management tester couldn't stop talking about the 17-inch display: "I was able to have both application windows open at the same time, where I would have never thought to do that with a smaller monitor. In editing the presentation in PowerPoint, I liked the fact that I could get a thumbnail view of all the slides at once on the same screen. . . . It was easy."

Praise from management testers, as effusive as it was, still wasn't as expansive as that from the number crunchers, who gave the large monitor a satisfaction rating of 4.4 on a 5-point scale.

One said, "The large screen made it possible to see a large portion of the open spreadsheets at the same time, and that's important for cutting and pasting. The text, graphics, and graphs were all very legible and this reduced eyestrain considerably." Another number cruncher remarked, "The large monitor is a joy."

But, as irony would have it, the number crunching tests showed the least objective performance improvement. *Least* doesn't really describe it. The measurable performance improvement, based on the time it took to complete tasks, was a dead zero. Perhaps our conclusion should be that although number crunchers may believe they're working more efficiently with a larger monitor, illusions don't pay the bills. But don't forget, they will gain such benefits as a more comfortable set of working tools that may add significantly to their job satisfaction and ultimately to productivity.

Our Recommendation For managers, spending $1,200 on a 17-inch monitor makes sense. With the productivity they'll gain, they'll earn back costs and more within a matter of months—fast enough to stay abreast of the current generation of monitor technology. Other high-paid workers such as graphic designers also merit at least a 17-inch monitor as soon as possible. Productivity on administrative assistant tasks cost-justifies the purchase in 26.1 months—still faster than a typical depreciation schedule. And the number crunchers? They want a bigger monitor so badly, yet have the least payback ammo to get one. While the ROI justification won't help them, the positive impact on job satisfaction and accuracy are strong arguments for their upgrades. Our verdict: Everyone can use more space to stretch out.



Show Your Face: A 17-inch monitor with higher resolution gives you more onscreen real estate and makes it easier to perform drag-and-drop tasks than a 14-inch monitor.

Make Your Case: Buying Room for a View

1. A larger screen makes **cutting and pasting** among multiple programs faster and easier.
2. Spreadsheet users increase accuracy and **reduce frustration** by seeing more of their work.
3. Online and **drag-and-drop editing** is significantly faster thanks to more room to move around.

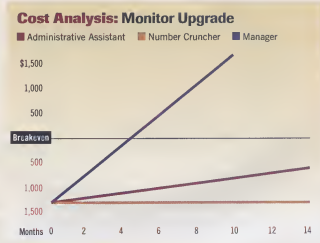
Our monitor tests illustrate an age-old maxim: Just because you have more doesn't mean you'll use it better. In tests, the managers gained a 9 percent increase in productivity when they moved to a 17-inch monitor. The administrative assistants gained a 3 percent improvement with the same upgrade. Our lab tests didn't demonstrate a performance gain for the number crunchers, but these workers cited significantly higher job satisfaction, which could influence lower turnover rates. However, the extra real estate did prove advantageous for workers who edit onscreen: Extra room for more or larger open windows made drag-and-drop editing faster.

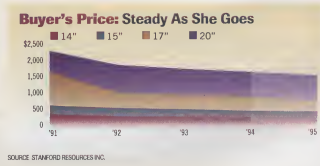
End in Sight: Unlike number crunchers, managers have the potential to earn back the cost of a larger monitor in 90 working days.



Cost Analysis: With their increased productivity, the managers would earn back the expenditure in 4.5 months. Administrative assistants would need 26.1 months. Number crunchers benefit from the upgrade, but not in measurable payback.

Buyer's Price: Prices of 17-inch monitors have already dropped from their initial heights and won't decrease significantly in the immediate future. Therefore, it stands to reason that buying a bigger monitor makes sense sooner rather than later, but only after you've already invested in other upgrades that pay back faster, such as RAM and CPU.





SOURCE: STANFORD RESOURCES INC.

See More, Work Better: We found positive cost justification for upgrading administrative assistants and managers—two of the three types of workers—to 17-inch monitors. Number crunchers may gain productivity in ways we didn't measure, and they can certainly argue for increased accuracy and job satisfaction. Reduced mental fatigue, especially when working on detailed spreadsheets, is also a compelling reason to upgrade.

AMMO — REV UP PRODUCTIVITY ON YOUR SCREEN

1 Choose the kind of tasks you do most often.	2 How many applications do you run at once?	3 The best ammunition in your argument for upgrading is . . .
Administrative	Three or more	• Save time when juggling multiple tasks. • At 26.1 months, your ROI beats depreciation.
	Fewer than three	• Easier drag and drop. • At 26.1 months, your ROI beats depreciation.
Number Crunching	Three or more	• Increased accuracy through drag and drop. • Enhanced job satisfaction.
	Fewer than three	• Improved concentration and less fatigue. • More precise editing with less eyestrain.
Managerial	Three or more	• A rapid ROI of 4.5 months. • Easier to work among multiple documents.
	Fewer than three	• A rapid ROI of 4.5 months. • Precise control of detailed reports.

Performance Booster

Want big gains in productivity? Upgrade your CPU.

Our usability tests revealed that, across the board, a new processor was the biggest productivity booster of any of the three upgrades we evaluated.

A traditional rule of thumb for predicting computing power is that processor performance will double every 18 months. This is all very well, but a 100 percent increase in power doesn't automatically translate into a 100 percent increase in productivity.

Still, in our administrative tasks tests, moving from a 386 to a 486 processor increased productivity by 35 percent, while a Pentium processor boosted it still more to 42 percent. Number crunchers showed strong if slightly smaller gains: 17 percent using a 486 and 31 percent with a Pentium. Although the managers' increase in productivity with a 486 matched that of administrative assistants at 35 percent, they gained the across-the-board best increase with a Pentium, which boosted their productivity by an impressive 50 percent.

But because managers typically use their PCs less than number crunchers, the payback for a Pentium system is actually quicker for number crunchers.

Number crunchers use PCs more extensively but at a slightly lower salary than managers. At a pay rate of $40 an hour, the number cruncher needs only 1.2 months to make the 486 upgrade pay for itself, and just a trifle more—1.7 months—to get his or her money's worth from a Pentium. The $50-an-hour manager needs only 1.1 months to earn back the cost of a 486, but needs 2 months for a Pentium. The administrative assistant would have to work for 2.5 months to earn a 486 and nearly half a year to cover the cost of a Pentium upgrade.

Money in the Bank Over 12 months, all three categories of workers profited from both upgrades. But the potential payback for the number crunchers was highest with the upgrade to a Pentium system: a handsome $17,629 return on the $3,000 investment. The Pentium payback for the manager was $14,929, a number that the front office isn't likely to sneeze at either.

On a 486 upgrade, the manager's 12-month payback was greater than that of the number cruncher—$11,514 compared to $10,415. For the administrative assistant, the productivity gain was greater than the number cruncher after either CPU upgrade. But at a typical salary of $13.50 an hour, payback—while in the black—was much lower than that for the other employees. In fact, the administrative assistant gets a better 12-month payback from a 486 upgrade ($4,451) than from a Pentium ($3,370).

All workers rated their satisfaction with the Pentium near perfect: It was graded 4.5 on a 5-point scale for the administrative assistant, 4.9 for the number cruncher, and 4.8 for the manager.

Our performance numbers belie the notion expressed by some testers, that the Pentium could even be too much processor. "It sure is nice to have everything go at Pentium speed," one administrative tester said, "But this is overkill for text entry. How fast can you type?"

The 486 received considerable praise, however. "This is a joy to use. . . . A productive tool!" said one number-crunching tester.

The lesson to be learned is that you can't make an upgrade decision based on a single factor. The different kinds of tasks being performed on the computer, and the number of hours the computers are used, yield different productivity increases. When salaries are factored into the ROI equation, the payback period becomes a spectrum, not a fixed point. Although all CPU upgrades paid for themselves—and then some—within a year, don't assume that a CPU upgrade will lead to the same potential productivity payoff in every department.

Our Recommendation Number crunchers will be glad to hear that they merit the fastest system possible. They gain so much from a system upgrade that they benefit from early buying of even high-cost new-generation CPUs. Managers, too, can justify early purchase of new-generation processors because they can more than quadruple the investment. However, the administrative assistants can maximize payback by waiting for prices to come down slightly. Still, with a payback period of less than six months, you'll save redundant installation expenses by upgrading to the CPU you'll stick with.



Ultra Speed: Upgrading to a 486 or Pentium processor will speed up such everyday tasks as opening applications, saving changes, and switching between programs.

Make Your Case: Buying More Time with a Faster CPU

1. Handle **more applications at once** with a faster CPU—you save time by having work tools handy.
2. A system upgrade can **reduce the downtime** while your system saves or processes data.
3. Dragging and dropping data and **moving among apps** is faster with a speedier system.

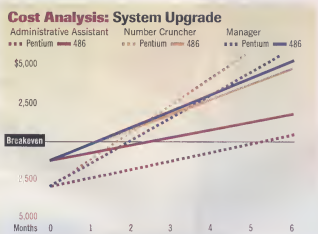
The real question is whether the money you save by not buying the next-generation CPU outweighs the lost potential for increased productivity. That, our tests show, depends on the type of work your CPU does. Managers upgrading to a Pentium system showed a 50 percent increase in productivity; with a 486, they won 35 percent. Administrative assistants also gained 35 percent with a 486 upgrade and 42 percent with a Pentium. Number crunchers won a 31 percent gain with a Pentium; 17 percent with a 486.

Speed Matters: A faster CPU is cost-justifiable for all, but managers upgrading to a 486 earn it fastest—in 22 working days.



Cost Analysis: Everybody showed a positive ROI, but number crunchers upgrading to a Pentium earned the biggest financial payback because of the hours they work per month.

Buyer's Price: Anyone who's purchased a PC has later seen the price plummet like a comet hell-bent for Jupiter. Because most other components tend to remain the same from one generation to another, the price of new-generation microprocessors such as the Pentium make a new CPU expensive. But the new generation pushes the previous generations' prices down. That's why your best buy may be a processor, such as the 486, that has recently been dethroned.





SOURCE: INTEL CORP. AND PC COMPUTING

Buying Time: The productivity you gain from upgrading to a 486 or Pentium earns you a swift and ongoing return on your investment. ROI is such a strong argument for all workers that depreciation schedules become irrelevant. Any product or upgrade that pays for itself in fewer than six months is worth purchasing as soon as your budget permits.

AMMO — WORK FASTER WITH AN UPGRADED SYSTEM

1 Choose the kind of tasks you do most often.	2 How many applications do you run at once?	3 The best ammunition in your argument for upgrading is ...
Administrative	Three or more	• An ROI of 5.3 months for a Pentium is good. • Quicker to open and close applications.
	Fewer than three	• A 2.5-month ROI for a 486 is impressive. • Faster cut and paste.
Number Crunching	Three or more	• A 1.7-month ROI for a Pentium is great. • Swift negotiation of multiple applications.
	Fewer than three	• A 1.2-month ROI for a 486 is exceptional. • Faster number crunching.
Managerial	Three or more	• A 2.0-month ROI for a Pentium is great. • Faster movement among applications.
	Fewer than three	• A 1.1-month ROI for a 486 is exceptional. • Faster data retrieval.

When all else fails,

Starting at $119

There are three types of computer users: those who have lost data due to a power problem, those who are going to, and those who have protected themselves against the inevitable surge, blackout or brownout with the most reliable UPS they can buy: Back-UPS by APC. In fact, editors and users alike agree that if your system demands absolute reliability, you can depend on APC Back-UPS.

According to a study by Bell Labs, undervoltages represent the overwhelming majority of power problems likely to hit your computer. The question is not if a failure will occur, but when. Whether due to construction, wiring, weather, other office equipment, or accidents, power problems are as inevitable as death and taxes. That's why you need instantaneous battery backup power from the Back-UPS to prevent data loss, hard disk crashes, and hardware damage.

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APC Voted most reliable by 3-to-1
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PC MAGAZINE

In a recent poll by PC Magazine's MagNet, APC was voted the most reliable UPS manufacturer by a 3-to-1 margin. That's dependability that will see you though years of unmatched power protection.

PC MAGAZINE UK EDITORS' CHOICE

"The clear winner in price performance...it's unbeatable..."

August 1993
APC Back UPS 1250



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Free Power Solutions Handbook

What are the myths and musts of PC protection? What are the 10 most common power protection mistakes? The top tips for adding reliability to your LAN? Get your FREE copy and find out!

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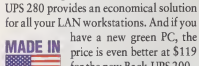
Back-UPS is going on three years...no other brand is as reliable."

If you're protecting a network server, a communications interface port (on models Back-UPS 400 and higher) provides the security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

And since data processed on networked clients needs protection too, the $139 Back-UPS 280 provides an economical solution for all your LAN workstations. And if you have a new green PC, the price is even better at $119 for the new Back-UPS 200.

MADE IN USA

Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how affordable it has become is easy...



Back-UPS (L to R)	Application	Sugg. List
200	Green PCs, small desktop systems	$119
280	Desktop systems, LAN nodes, POS	$139
400	Desktop 486, 386 systems, servers	$229
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600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799

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I've relegated that unit to non-critical household stuff like my VCR."



More than... 2,000,000 Satisfied Users

APC has won more awards for performance and reliability than all other UPS vendors combined...including five consecutive LAN Times *Readers Choice awards...*

PC World Top 20 Upgrade

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Windows Mag. Readers' Choice

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Call today and find out (the easy way) why more than 2,000,000 satisfied users bank on Back-UPS from APC. With more awards than all other brands combined, field-proven reliability, and a two year warranty, Back-UPS are power protection you can purchase with confidence.

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just hummin' away on the same power line that was eating the other brands alive!"

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PC MAGAZINE UK EDITORS' CHOICE

August 1993
APC Back-UPS 1250

"The clear winner in price performance...it's unbeatable..."

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"All other brands of UPS die regularly in this lightning prone environment. My APC won't die!" said Paul Sisilli, Systems Analyst, City of Port St. Lucie. "With other brands, users don't find out until it is too late. The power interruptions here are very hard to live with. The other brands are dying off. Typically they last just beyond their warranty period. My Back-UPS is going on three years...no other brand is as reliable."



Don Truax knows first hand about Back-UPS reliability: "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house...my computer never blinked. Each morning I get a surge down the line and both APC's hate it - they simultaneously 'holler 'n clamp' while my 'Brand T' quietly sleeps in. I've relegated that unit to non-critical household stuff like my VCR."



Andrew Wargo, Manager at Baxter Land Company, tried two other brands before Back-UPS. "One lasted a few days, a second one went up in smoke after 48 hours, a third lasted less than 24 hours! I then bought my Back-UPS for less than half of what I had paid for the others. We've purchased three more Back-UPS and for the past 14 months they've been just hummin' away on the same power line that was eating the other brands alive!"

If you're protecting a network server, a communications interface port (on models Back-UPS 400 and higher) provides the security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

And since data processed on networked clients needs protection too, the $139 Back-UPS 280 provides an economical solution for all your LAN workstations. And if you have a new green PC, the price is even better at $119 for the new Back-UPS 200. Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how affordable it has become is easy...

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Back-UPS (L to R)	Application	Sugg. List
200	Green PCs, small desktop systems	$119
280	Desktop systems, LAN nodes, POS	$139
400	Desktop 486, 386 systems, servers	$229
450	Tower 486, 386 systems, servers	$279
600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799

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PC World Top 20 Upgrade

Windows Mag. Readers' Choice

LAN TIMES Readers' Choice 1994

Reseller News Editor's Choice

Call today and find out (the easy way) why more than 2,000,000 satisfied users bank on Back-UPS from APC. With more awards than all other brands combined, field-proven reliability, and a two year warranty, Back-UPS are power protection you can purchase with confidence.

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Circle 116 on reader service card.

Jammin' the RAM

RAM is the golden goose of computing. It's relatively inexpensive and everything it produces is pure gold—golden productivity, golden glows on the faces of workers, gold in the company bank. In our tests, adding memory to a system increased the work output of all types of employees. And the time it took for the extra RAM to pay for itself was so short in all situations that you could easily dismiss it and say the memory was free—except that it's better than free. It's an upgrade that pays for itself over and over, as many as 26 times in a single year.

We assumed most workers would start with 4MB of memory. Even adding as small an increment as four megabytes improved productivity for all workers. We saw an 11 percent gain for administrative assistants, a 12 percent gain for number crunchers, and a whopping 26 percent increase for managers. (In addition, our results support the recommendation from the sellers of some new Windows programs, such as WordPerfect, that you start with a minimum of 6MB.)

Doubling 8MB to 16MB, however, produced some surprising results. Moving up to 16MB boosted productivity for an administrative assistant 26 percent over the original 4MB—more than double the increase obtained by working with an 8MB system.

Not So Fast Surprisingly, using 16MB of RAM for a number cruncher barely made a difference in productivity compared to 8MB. Where 8MB provided a 12 percent increase for the number cruncher, 16MB was able to better that by only one point to 13 percent. The amount of productivity that a total of 16MB brings to a manager was impressive at 36 percent.

At a quick glance, it looks like the obvious decision is to upgrade administrative and managerial workers to 16MB, but bring the number crunchers up to only 8MB because crunching makes so little use of 16MB. That would be true if each of the three types of workers earned the same and used their PCs for the same number of hours. But the number cruncher's healthy salary ($40 an hour) and heavy PC use means that an upgrade to 16MB pays for itself in less than a month, and over a year's time that extra one percent boosts the number crunchers' potential productivity payback to $8,410—that's $408 more than the 8MB upgrade payback for an expense of only $320 more.

The numbers are backed by the testers' comments. One administrative usability tester found that the speed of inserting a video clip in a Word document was unacceptable even with 8MB. A number cruncher noted that calculations with 8MB were slightly slower than with 16MB, and the smaller memory configuration made switching among applications sluggish. But with 16MB, an administrative tester noted: "Beautifully easy. The word processing sections were responsive and smooth. Merging the letters and inserting the graphics files didn't take any time other than what it took to load the files off the disk."

Conclusion? Adding memory makes fiscal sense. Even when RAM is added to the PC of an administrative assistant, whose lower salary implies the most time for upgrades to pay for themselves, an upgrade to 16MB pays for itself in less than six weeks. And although the administrative assistants' potential $4,037 payback in one year using 16MB pales next to the potential $12,768 payback for a manager, four grand will still pay for a nice file server or a small-office Christmas party.

The cost of memory is subject to some fluctuation. Events such as the mid-1993 fire at Japan's Sumitomo Chemical Company—which produces 60 percent of the world's supply of epoxy resin used in integrated circuits—can cause memory prices to skyrocket. Barring such unusual pricey periods, you should buy memory upgrades sooner rather than later.

Our Recommendation Upgrade all of your employees to 16MB or as close as you can afford. If you have to skimp somewhere, limit your number crunchers to 8MB. Your biggest dollar return will come from managers, so make sure they all get 16MB.

If it's time you want to gain, give your administrative assistants a memory boost and you'll see them save more than 300 hours a year. While their relatively low salaries mean they won't earn the investment back as fast as other workers, the fact that they potentially will have so much more time for other tasks should make the investment worthwhile.



In Memory: Gone are the days of DOS-only. Now with an inexpensive memory upgrade, you can handle multiple Windows applications and reams of data at one time.

Make Your Case: Buying Memory Pays Off Quickly

1. More memory lets you **store more applications** on your system and use more of them at once.
2. Windows and Windows applications require more than 4MB of memory to **run smoothly.**
3. Upgrading memory is an **inexpensive investment** that workers can earn back quickly.

Our tests show that everyone's performance improves with upgraded memory, and it's so cheap, you should buy it as soon as possible. The market price of memory fluctuates somewhat, but in general it's an inexpensive way to measurably increase your productivity potential.

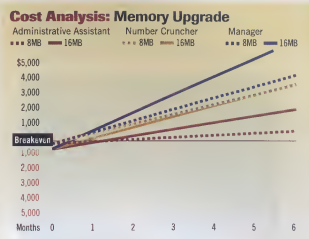
Managers logged the biggest productivity boosts: 26 percent with an 8MB upgrade, 36 percent with 16MB. Administrative assistants gained a 26 percent productivity increase with 16MB, but only 11 percent with 8MB. Number crunchers earned a 12 percent increase with 8MB, but only a 13 percent increase with 16MB.

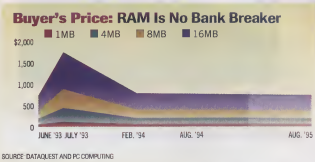
More in Store: Most workers will earn a memory upgrade quickly, but number crunchers going to 8MB lead with just four working days.



Cost Analysis: Most memory upgrades pay for themselves in less than a month—and the return on your expenditure will just keep growing.

Buyer's Price: The cost justification is strong for upgrading all of your users to at least 8MB (and probably 16MB), but in case that doesn't convince you, here's another reason: Being hampered by limited memory takes a psychological as well as financial toll on companies. Workers with more memory cited greater job satisfaction.





SOURCE: DATAQUEST AND PC COMPUTING

The Strength of Memory: Increasing memory to at least 8MB, and preferably to 16MB, is a must-do for any system used in an office environment. The payback is so fast you'll likely have earned back the memory before you even pay the invoice for it. In addition to saving time, you'll increase worker satisfaction by reducing frustrating delays during routine procedures.

AMMO MORE MEMORY GIVES YOU **MORE CAPACITY**

1 Choose the kind of tasks you do most often.	2 How many applications do you run at once?	3 The best ammunition in your argument for upgrading is . . .
Administrative	Three or more	• Exceptional 1.4-month ROI for 16MB. • Keep multiple applications on your system.
	Fewer than three	• Exceptional 1.1-month ROI for 8MB upgrade. • Store more information at your fingertips.
Number Crunching	Three or more	• A slam-dunk 0.7-month ROI for 16MB. • Use more applications at once.
	Fewer than three	• A slam-dunk 0.2-month ROI for 8MB. • Store more information at your fingertips.
Managerial	Three or more	• A slam-dunk 0.4-month ROI for 16MB. • Store and use more applications.
	Fewer than three	• A slam-dunk 0.2-month ROI for 8MB. • Create graphics with presentation software.

Try it, You'll **Like** It

Memory in the labs is one thing. But how about real life? What happens when real people in real offices get a chance to upgrade their workaday PCs? To double-check our test results, we gave memory boosts to the PCs of three people at an accounting firm. At Heather, Sanguinetti, Caminata & Sakai in Stockton, California, we installed enough memory chips on loan from manufacturer Kingston Memory to boost a partner's PC from 8MB to 16MB and two other accountants' PCs from 4MB to 8MB.



Memory SWAT Team: *PC Computing* Associate Technical Editor Scott Naylor installs Kingston memory upgrades in the desktop systems of three hard-working accountants.

The two number crunchers and one manager estimated the number of hours they spend on their computers each month and gave us ballpark salary ranges for their type of work in their part of the country. We plugged in our productivity figures and street prices for memory, and ran our formulas (see "How We Measured the ROI of Upgrading," page 198).

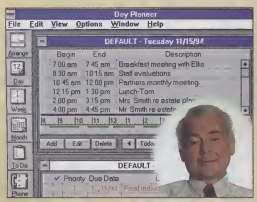
Verdict Although the added memory didn't perform miracles, the users saw real benefits—enough that by the end of the three-week test period, the firm was asking if it could buy the borrowed SIMMs.

Before the influx of memory, most of the accounting firm had not been using Windows. Senior Accountant Mark Chase and Staff Accountant Scott Hixson had both used DOS-based Quattro Pro, accounting, and tax software on their 4MB PCs. Neither had been particularly happy with his forays into Windows.

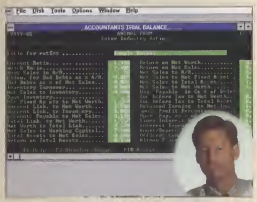
"Windows seemed to be the new thing, the in thing. Everybody's going to it," says Chase, who uses a 33MHz 486 PC. "But it frustrated the heck out of me. It was too slow." He complains that learning new keystrokes and commands added to the slowness of using Windows applications.

Hixson had experimented with Quattro Pro for Windows on his 40MHz 386 system, but also found it too slow—until his machine memory was upgraded to 8MB. The improvement was immediate.

AT WORK MORE MEMORY MADE A **DIFFERENCE** TO THIS STAFF



"The more RAM your machine has, the faster and better it runs. I want more memory for switching between programs." **DAN CAMINATA**



"More memory eliminated the one big obstacle to using Windows—having to stare at the screen while it does nothing." **MARK CHASE**

"It used to take 15 seconds just to change cells," Hixson says of Quattro Pro for Windows with 4MB. "Now it works like it's supposed to."

Both accountants also used the extra memory to create bigger RAM disks for their DOS programs, but Chase said neither of them noticed differences in their machines' performance.

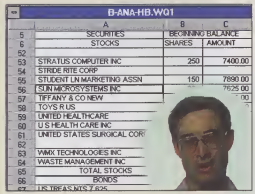
"For DOS, there is no particular advantage," Chase says. "I didn't notice that I got into Quattro Pro or my tax software faster."

Before the experiment, the only person at the firm who'd been using Windows regularly was one of the partners, Dan Caminata. He already had 8MB of RAM on a 66MHz 486 PC. Caminata noticed no significant differences between 8MB and 16MB when using Excel, a real-world result that confirms our in-lab testing with spreadsheet functions. Most other programs Caminata used were DOS-based, and he saw little difference there. "I'd be just as happy with 8 megs as 16," Caminata says.

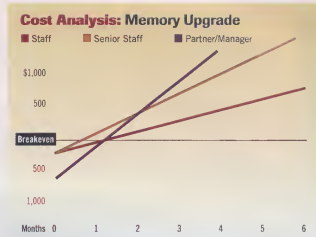
Added Benefits Another partner, Tom Sakai, didn't take part in the experiment, but oversees the firm's PC use. He adds his own comments: "I'd like for us all to use Windows for Workgroups, but you can't load it on a computer with 2 to 3 megs. If all my computers were 8 megs, we'd use Windows for Workgroups. Printing's a lot faster."

But, like Caminata, Sakai saw no reason to increase memory above 8MB until 8MB became a limitation. "I'd go to 16 megs if I started running out of memory, but that's not happening yet," he reports.

Even when their own experience didn't show a noticeable improvement between 8MB and 16MB, Sakai still decided to purchase the SIMM chips that had raised Caminata's system to 16MB. Why? "It's so cheap,"



"If they want me to use Windows, they don't have a choice but to leave in the RAM. And I have to use Windows, or I'll be outdated." **SCOTT HIXSON**



Worth the Money: The accountants at Heather, Sanguinetti, Caminata & Sakai had no trouble justifying their memory-upgrade purchase. Potential payback in six months is shown above according to job function.

Sakai says, noting that given the other benefits of upgrading, "the expense just isn't an important factor."

Sakai believes his staff benefited from the memory in important ways other than productivity increases. "The psychological impact on the user is probably more important than any real savings in total time," he explains. "It's amazing how the outlook of the user improves if he feels that he has a fast machine and doesn't have to wait even 15 seconds on the PC."

He adds, "The people with slower machines always seem to have an excuse for excessive time spent on a project. They look with envy at those with faster machines."

In total, our results showed that each worker's upgrade would pay for itself in less than a month and a half; the staffer would save 115 hours a year, the senior staffer, 173, and the partner/manager a whopping 259 hours a year.

The Profitability Challenge Sakai points out one of the dilemmas of technology upgrades faced by service businesses. "We only bill for our time, so I have to be careful. When we save time, we can lose fees. I need to be able to justify passing along the cost of investments in new technology to my clients."

On the bright side, Sakai observes, clients are willing to pay for upgrades when it will result in faster work and hence, lower fees for them. The happy medium, says Sakai, isn't too difficult to find. "I don't feel that I need to be on the cutting edge of technology, but to be fair to my clients I have to keep up with technology. If I ran 286s, I wouldn't be fair to my clients, but neither do I need Pentiums on every desk."

One advantage of saving time—even for companies that bill their time—is that it creates the opportunity to add new clients or projects to the schedule.

Done judiciously, upgrading can thus become a tool for growing the business.

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PC MAGAZINE EDITORS' CHOICE
August 1994
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Circle 162 on reader service card.

ROI: How to Get the Goods



Admit it. You have already figured out several ways to defeat your company's Byzantine procurement maze. If push comes to shove, you can slip the PC you want into an appropriation as an office chair and nobody is the wiser. Well, here's a chance to do the same thing, only honestly. Why bother? First, very soon the office will be full of lonely office chairs. Second, we have to deal with accelerating change in the PC world. We will buy many new goodies in the next few years. We need a plan to justify purchases for multimedia, remote computing, and more powerful PCs.

The easiest way to make a decision about how to spend your limited funds is by using the kinds of formulas in "How We Measured the ROI of Upgrading," (see page 198). These are great for narrowing the purchase decision to a few productivity-increasing options, and will help you identify the workers who will benefit most from your expenditures.

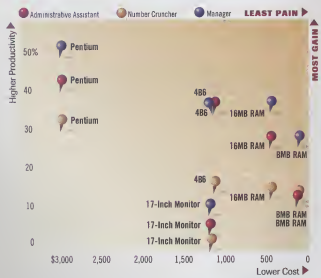
They also provide enough ammunition to convince the budget rein-holders to cough up money to buy the items that cost less than office furniture. But the more broad-reaching and diverse a worker's tasks—and the higher the price tag on your target—the harder it is to calculate. Anything having to do with company-wide networks, for example, gets complicated. At that point, you'll need more sophisticated analysis—something you can count on the accounting folks to defend with you. Unfortunately, that means a little number crunching.

If the charts and reviews don't go far enough, you need financial analysis tools such as net present value (NPV) and internal rate of return, also known as return on investment (ROI).

The NPV is arguably the most effective method to use. Sound complicated? Fortunately, it isn't. NPV is easily calculated with

TOP BUYS

HOW THE **UPGRADES** COMPARE TO EACH OTHER



Finding Value: Inexpensive enhancements with a high rate of return through improved productivity—isn't that every manager's dream? Here's how the upgrades we tested stack up. Those near the upper right should be on your list to incorporate into the office as soon as you can—which is not to say the other items should be overlooked. Some of the high price-tag items will save your employees enough time to pay for themselves in a matter of weeks.

spreadsheets and pocket calculators. And it will immediately show the financial types that you know what you're doing.

Internal rate of return is a variety of NPV that gives a percentage ROI. The NPV number is a little harder to calculate, but appropriate when you need to throw your weight around.

If you're starting to think that justifying the purchase you have in mind isn't so simple after all, here's a bright idea: Ask your accounting folks to do the calculations. Think about it. They'll be tickled to death that you're working with them instead of succumbing to the stereotypical adversarial silliness.

When possible, I convince the accounting gurus to interview end-users to compile justification data. They are then able to plug their own data into financial tools they believe in. I sit back and play like I don't know NPV from a mouse. Everybody seems so much happier that way. And it works.

MARC DODGE, *telecom department manager, is still trying to cost-justify virtual reality.*



On the Calendar: If you apply the time saved by using upgraded equipment to additional work, the added productivity boost can soon pay off the cost of an upgrade.

The Inside Story on Products

CD-ROM Drives, Fax Modems, and More

Shopping List: We have hard data from our Usability Labs on only three of these ten categories, but based on what we learned, we're willing to take a stand on other obvious upgrade and add-on candidates. A system upgrade is a clear-cut choice for everyone, and embarking on the use of a PDA for scheduling, on-the-go communications, and notes is also likely to prove productive. Given the payback of more memory, you'll also leverage productivity with compression and a memory manager. A high-speed modem can cut the high fees that go along with online computing, and front-end software will make navigating your system easier and faster.

	Low Cost (less than $500)	Easy to Install and Configure	Easy to Learn and Use	Easy Used-Support	Cost
17-Inch Monitor Engineers and programmers pay for these with productivity.		✓	✓	✓	$1,000
CD-ROM Drive These are great fun, but can be truly awful to install and support.	✓		✓		$150 to $300
Compression Software Save the cost of a hard-drive upgrade.	✓	✓	✓		$75
Document Manager Petty cash item. Beware of support.	✓	✓	✓		$50
Electronic Organizer (PDA) Great personal productivity tool.		✓	✓	✓	$400 to $800
Front-End Software Save time by organizing your desktop.	✓	✓	✓	✓	$120
High-Speed Fax Modem Reduce charges to access online services.	✓				$120 to $200
Memory Manager Weigh initial cost savings and support against more memory.	✓	✓	✓		$60
More Memory 8MB is the practical minimum for Windows.	✓	✓	✓	✓	$45 per MB
System Upgrade Look for productivity gains.			✓	✓	$1,500 to $3,000



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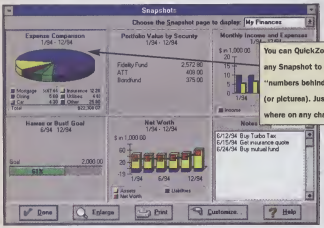
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Help

BRIAN LIVINGSTON CREATES A PERSONALIZED HELP SYSTEM

Make an Online Reference Guide

We may need to invoke the Endangered Species Act to preserve the printed manuals that we've always taken for granted in our computer software packages. It seems that more and more software companies are deciding that manuals are expendable. The worst offender is Microsoft, which decided not to include a command reference manual in the MS-DOS 6.*x* package. You can't look up examples on the usage of new commands such as CHOICE, DELTREE, or MSD in the *MS-DOS 6 User's Guide*. Instead, you need to purchase a good DOS reference book to get documentation for all the DOS commands. Or type `help {command}`, which will yield a few screens full of text describing each command.

Online help is no substitute for a well-written printed manual. This is true of both commercial software and software you might write in-house. Unlike online help, you can peruse printed information while carpooling, relaxing by the pool, or whenever you don't have a computer handy.

Some computer companies argue that most people never read software manuals. That isn't the point. Most people never use the spare tire they carry around in their car, either; it's there in case they need it. When your software or your computer is down, online help can't help you. We should all expect complete, printed reference material with any software we buy.

Having said this, there are many cases in which online help is a blessing. If the information you need is simple, then typing `help {command}` is fast and easy.

Since Microsoft added Help to the arsenal of all DOS 6.*x* users, we might as well take advantage of it. I've created a simple way to make the Help command display informative text about *any* character-based program. This includes batch files, network utilities, and shareware programs I use that don't come with their own help systems.

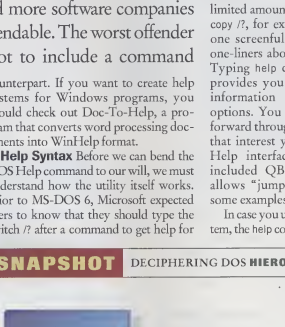
Note that we're talking about the DOS Help engine only, not its Windows counterpart. If you want to create help systems for Windows programs, you should check out Doc-To-Help, a program that converts word processing documents into WinHelp format.

Help Syntax Before we can bend the DOS Help command to our will, we must understand how the utility itself works. Prior to MS-DOS 6, Microsoft expected users to know that they should type the switch /? after a command to get help for that command. For example, you would type `copy /?` at a DOS prompt to see the options for the copy command.

Under MS-DOS 6, the /? switch still works for most commands. But you get a limited amount of help when you use it: `copy /?`, for example, displays less than one screenful of information, mainly one-liners about various COPY options. Typing `help copy`, on the other hand, provides you with several screens of information about the command's options. You can scroll backward and forward through the text to find sections that interest you. The character-based Help interface requires Microsoft's included QBasic interpreter, and it allows "jump words" to lead you to some examples and syntax illustrations.

In case you use an older-style video system, the `help` command provides a number

SNAPSHOT DECIPHERING DOS HIEROGLYPHICS



The batch file described in "Try Homemade Help" (page 221) shows you how to add custom explanations to the DOS Help engine.

1. All You Get: The DOS Help engine is limited—it displays only the preset Help screens provided by Microsoft. You can't customize or edit these text screens, and you certainly can't add new ones.

2. Make Your Own: By creating your own help screens, you can explain how to use any program—from network utilities to shareware that doesn't come with its own Help system. You can even improve on the cryptic DOS Help screens by writing your own, with company-specific examples.

WORKAROUND — TRY HOMEMADE HELP

Personal Help Desk: Here's a simple batch file that lets you create help for any character-based DOS program. Save it in a directory in your Path and name it GETHELP.BAT.

```
@echo off
if "%1"=="" goto doshelp
if not exist c:\helptext\%1.txt goto doshelp
edit c:\helptext\%1.txt
goto end
:doshelp
c:\dos\help %1 %2 %3 %4 %5 %6 %7 %8 %9
:end
```

The first if statement switches to the DOS Help facility if the first parameter after help is blank. The second if statement switches to DOS Help if there is no text file in the \helptext directory that matches the command name that the user typed. If there is a matching file, it is displayed in Microsoft's Edit utility, which lets the user scroll up and down in the help text at will.

Note: Edit will not be able to display your help text files if you use switches on the command line, such as /G for CGA systems (as described under "Help Syntax," page 220). If your system requires switches like these to make Help work, place these switches after help in the :doshelp section of the batch file above. For example:

```
c:\dos\help /g %1
```

of switches to accommodate you, using the following syntax:

```
help [options] [topic]
```

Following are the available switches:

/B lets you use a monochrome (amber or green) or paper-white monitor with a color graphics card.

/G provides the fastest screen updates for old CGA systems.

/H displays as many screen lines as your video hardware is capable of.

/NOHI lets you display Help text on monitors that don't support high-intensity (extra-bright) text.

If you type help by itself at a DOS prompt, you get a list of all commands that are presently accessible in the Help system.

Do-It-Yourself Help Now comes the interesting part. Let's say that you've explained to the computer users in your company that they can use Help to get basic information on character-based commands. But you also have other programs for which you want users to be able to access Help. What do you do?

One possibility would be to write your own batch file called HELP.BAT. You could place this batch file in a directory that appears in the Path statement *before* the appearance of the DOS directory. That way, when users type help [topic], they will run your batch file instead of the Help command itself.

For example, if HELP.BAT were in the directory C:\BAT, and MS-DOS 6 were in the directory C:\DOS, the Path statement in your AUTOEXEC.BAT would look something like this:

```
PATH=C:\BAT;C:\DOS
```

There are two problems with this approach. The first is that MS-DOS likes to place its directory at the *beginning* of the path, so reinstalling DOS could change the path order. The second is that you might happen to be in the C:\DOS directory when you type help [topic]. In that case, the Microsoft Help command (not your batch file) will run, and it will not provide any information on your shareware utilities and other programs.

A better answer is to use Doskey to guarantee that your batch file always runs, no matter what directory happens to be current. Doskey lets users write macros (RAM-based commands) that precede any internal or external command with the same name. Here's how to use Doskey to access your own Help files:

1. Create a directory called \HELPTEXT on your local drive or on a network drive. In this directory place any text files that document the programs for which you wish to provide help. For example, if you've written an in-house utility called

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MYPROG.COM, create a text file called MYPROG.TXT and place it in the \HELPTEXT directory. Make all the text files in this directory read-only, so they can't be altered by Edit (as described in Step 2, below). To make your files read-only, use the following command at a DOS prompt:

```
attrib +r c:\helptext\*.txt
```

2. Create a batch file called C:\BAT\GETHELP.BAT, containing the lines shown in "Try Homemade Help," page 221. Place this batch file in your C:\BAT directory or any directory in your Path. When the user types help {topic}, the Doskey command in Step 3 directs the user's command into the GETHELP.BAT file.

3. Insert the following line anywhere in your AUTOEXEC.BAT file:

```
doskey help=gethelp $*
```

The $* (dollar sign-asterisk) at the end is a replacement parameter that passes all command-line information after help to your batch file. Once Doskey is loaded in this way (which consumes about 3K of memory), typing help at a DOS prompt will automatically run GETHELP.BAT.

The batch file will look for a text file in your \HELPTEXT directory that matches the *topic* parameter. If it finds one, it uses the Edit command to display the text file (which you can scroll through, but not edit).

If no such file is found, the batch file then feeds the same command line into Microsoft's Help command. If a match is found, then Help displays the information. If no match is found, Help displays an error message to the user.

Putting Help to Work Now that we've covered how you can make your own character-based help text to supplement or replace the DOS Help text, what are some good ways to put this to use?

Any program or device driver that loads before Windows is an excellent candidate for its own help text. For instance, many device drivers that appear in CONFIG.SYS support optional switches. But unless you have a manual at your fingertips, these drivers are particularly inscrutable. Fortunately, it may take you only a few minutes with the manual to create a simple text file to document the proper use of these switches. This text file can then be stored on a network, or copied to the hard disks of the PCs that rely on that particular driver. (Make sure your GETHELP.BAT file looks in the network or local directories where you choose to place this help text.) Then, type help driver (or whatever the name of the device is) to get the help text you need at a moment's notice.

A network utility is another kind of program that may not respond to the DOS Help method of documentation. Many such utilities, however, have a simple syntax that lends itself to an explanatory help file. Find this information in the printed documentation, copy it to a convenient location, and you'll always have access to it.

Even if you never use anything but Windows, and you have eliminated all traces of DOS applications, you can find uses for character-based help. What do you do, for example, if Windows won't start? A common problem is that after you add or reconfigure some hardware, Windows hangs while loading. Typing help win at a DOS prompt produces nothing but an error message from DOS Help.

The answer? Create your own character-based help file called WIN.TXT. This file should contain the following information as a reminder of an odd-looking command that almost always lets Windows load. This command at least gives you the opportunity to keep working until you have diagnosed and solved the actual problem. If Windows will not start normally, type the following command at a DOS prompt:

```
WIN /D:CFSVX
```

The switches C, F, S, V, and X put Windows into a Debug mode and turn off various special functions of Windows 3.1 and later. These functions are frequently the cause of unexplained conflicts. To see what each switch does, type WIN /? at any DOS prompt. Note: The C switch applies only to Windows for Workgroups, so don't include it if you're using Windows 3.1.

That's it! You can certainly customize this technique to your heart's content. Make your GETHELP.BAT file do many things besides merely running text files through Edit. For example, you could use your favorite utility programs to run tutorials or other learning aids for the user. Or you could have the batch file display DOS-like messages, such as "Are you SURE you want help on that topic?" Let your imagination be your guide.

Doc-To-Help / WexTech Systems / (212) 949-9595 / $295 / *Reader Service No. 766*

BEST BUY TIME-TESTED FILE VIEWER

In "Try Homemade Help," page 221, we use Edit to view text files. While this is a viable option, its disadvantage is that users may modify your text files (it's all too simple to remove the read-only attribute). So here's an excellent alternative:

Take a Peek. List is a popular file browser/viewer, available as shareware. List lets you view ASCII, binary, and even archived (ZIP and ARC) files. You can scroll back and forth while viewing files, browse directories, control display options, and more. Replace any occurrence of EDIT with LIST in the batch file GETHELP.BAT listed in "Try Homemade Help."

Download LIST.ZIP from PC Contact's data library 3 (Utilities/Misc.). See page 262 for information on downloading files or ordering the disk from Public Brand Software.

PC Contact

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BRIAN LIVINGSTON *is the author of* Windows 3.1 Secrets *(1992) and* More Windows Secrets *(1993), and co-author of* Windows Gizmos *(1994). All three are published by IDG Books.*

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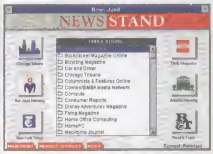
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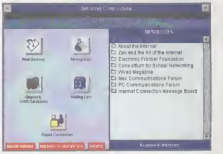


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IT WAS THE BEST OF UTILITIES...

The Windows Clipboard: Friend or Foe?

Cut, copy, paste, yawn. Even experts who use the Windows Clipboard a hundred times a day probably think about it for a total of ten seconds a year. That's too bad, because the lowly Clipboard is one of Windows' secret weapons. It's hard to imagine a Windows application in which you can't use the Clipboard to good effect. The beefed-up ClipBook Viewer that ships with Windows for Workgroups 3.11 is especially useful, and most of its power is undocumented—that section of the Windows manual reads like it was dashed off by a tech writer with a bad case of attention deficit disorder.

The most irritating aspect of the Windows Clipboard is its single-minded nature. Each time you cut or copy an object, it clears the previous Clipboard contents—unless you use a third-party utility like Clipboard Extender (see "Windows' Invisible Wall: The 64K Barrier," March, page 210) or an application-specific feature such as Word for Windows' Spike (see "Spike the Clipboard," right).

But with that significant restriction in mind, there's still plenty you can do with the Clipboard. Here are some hard-won secrets for moving data between Windows applications quickly and easily.

Longtime Windows users never use the Edit menu. Instead, their fingers jump to the old Clipboard shortcuts without direct intervention from the cerebral cortex. Ctrl-C (Copy), Ctrl-X (Cut), and Ctrl-V (Paste) are among the three most used keystroke combinations anybody in their right mind should use religiously. Curiously, though, there's no keyboard shortcut for the other Clipboard command—Paste Special.

Found on the Edit menu in many Windows applications, Paste Special is most often used to get in touch with OLE. The options that pop up when you click on Paste Special depend on the contents of the Clipboard and the code in the active application, but most OLE-aware applications use Paste Special to link the contents of two files or to embed one file in another.

You can also call on Paste Special when the Paste command doesn't work the way you want it to. For example, try copying a range from a worksheet in Lotus 1-2-3 Release 4 for Windows. Switch to Microsoft Word, press Ctrl-V, and the Clipboard's contents appear in a Word table. That's fine, unless you want the spreadsheet range to appear as unadorned text. In that case, choose Paste Special and select Unformatted Text from the list of options displayed.

Want to know what's in the Clipboard right now? Just run the Clipboard Viewer, found in the Main Program Manager group. The Clipboard Viewer is as bland as an English breakfast. You can press Delete to clear the Clipboard (handy if you're short on memory and there's a gargantuan graphic stored there), or you can view the contents in a format other than the default. Oh, you can also save whatever's in the Clipboard to a DOS file with an eight-letter name and the extension CLP, which can be read only by the Viewer utility. Ho-hum.

ClipBook in 3.11 In Windows for Workgroups 3.11, the Clipboard Viewer gets a new name and a few nifty new capabilities. The ClipBook Viewer was designed to let networked Windows users share Clipboard files, but you can use it even on a stand-alone system.

The ClipBook Viewer lets you save anything on the Clipboard as a ClipBook *page*. Each page can have a plain-English name. You can view a ClipBook as a simple list, or as a collection of thumbnails, which is ClipBook's main advantage. To see the contents of a single page, double-click on its ClipBook entry (double-click again to return to thumbnail view).

To create a ClipBook page, first make sure there's something on the Clipboard—a snippet of text, a graphic object, a spreadsheet range. Launch the ClipBook Viewer (found in the Main program group) and press Ctrl-V. ClipBook Viewer will prompt you for a page name; supply one (up to 47 characters, no commas allowed) and click on OK. Use the toolbar

WORKAROUND SPIKE THE CLIPBOARD

Copy, Don't Cut: Do you think the Clipboard's one-entry limitation is frustrating? Word 6.0 for Windows users have their own headache with the Spike feature, which lets you put multiple entries into a Clipboard-like buffer. Unfortunately, using the Spike feature cuts those entries—it doesn't copy them.

Here's a simple macro to fix the problem. In Word 6.0 for Windows, select Tools, Macro. Type CopyToSpike for the name, click Create, and type the following three lines between the Sub MAIN and End Sub lines: EditCopy, Spike, and EditPaste. (Be sure to enter each of these commands on a separate line with no punctuation.)

Press Ctrl-W to save. To assign a shortcut key to this macro, right-click on the toolbar, select Customize, and click on Keyboard. Scroll down the Categories list and select Macros. Click on CopyToSpike, and then click in the Shortcut Key box. Press Alt-F3, click Assign, then Close.

Use Alt-F3 in the same manner that you would use Ctrl-F3 (while text is selected). But watch out—it flushes the Clipboard. YAEL LI-RON

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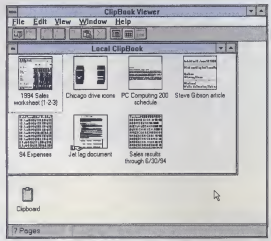
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SNAPSHOT CLIPBOOK'S THUMBNAIL VIEW

Optical Illusion: The ClipBook Viewer in Windows for Workgroups 3.11 looks like a multiple-item Clipboard, but that's a facade. It merely generates pages from individual CLP files and displays them on the same screen. In addition to the Thumbnail view, you can view the ClipBook's contents in a list form.



button or one of the View menu options to switch from the default list to the more appealing thumbnail view.

To use a ClipBook page, you (or a networked colleague) must first copy it to the Clipboard and then paste it into a document. It's not complicated: Highlight the page you want to reuse and press Ctrl-C, then switch to the target application and press Ctrl-V (or choose Edit, Paste Special).

Caveats There's nothing magical about the ClipBook Viewer. It merely adds a passable file management layer to hide the fact that it's still creating individual CLP files. And while there are good uses for ClipBook pages, there are a couple of gotchas lurking in the wings.

The amount of space that a simple CLP file can consume is frightening. There's little relation between the size of a file in its native format and its size as a ClipBook page. For example, a 900-word document saved in Word 6.0 for Windows format occupies 13,312 bytes. Save it in the universal exchange format, RTF, and it shrinks to a svelte 8,920 bytes. As a CLP file, it takes up 11,919 bytes. Then add a simple table to a 400-word document and watch the fireworks. Word's already bloated file format uses 14,336 bytes, whereas an RTF version is a more reasonable 8,762 bytes. But save it as a CLP file and it balloons up to 43,680 bytes. That's a high price to pay for quick access to a spreadsheet range.

You can't rename a ClipBook page (although you can copy an existing page, give it a new name, and delete the old one). Be careful: If you accidentally delete a CLP file, the Viewer gets hopelessly confused. And there's no way to search or combine pages.

Add it all up, and the ClipBook Viewer turns out to be a moderately useful applet with a few serious flaws. It's ideal for managing and sharing a small collection of text and graphics items, like boilerplate text and logos. But for more complicated management tasks, you'll have to look outside Windows. ED BOTT

PC Contact CLASSY TEXT EDITOR

Quick Notes

If the rudimentary Windows text editor, Notepad, doesn't serve your needs, try Quick Notes instead. This small text editor has multiple-file editing, word wrap, case conversion, a "most recently used" file list, a toolbar, search and replace, and other features found in full-blown word processors. Download QUIKNO.ZIP from PC Contact's data library 3 (Utilities/Misc.), or contact Brandon Fridley directly at (800) 397-0289 or by Internet at 74012.1635@compuserve.com. See page 262 for information on PC Contact or to order the disk from Public Brand Software.

WIN TIPS

INSTANT BLACKOUT

Problem: *For privacy and security, you need to activate a screen saver quickly whenever anybody walks by your desk.*

Solution: In Notepad or Sysedit, open WIN.INI, and search for the line that begins with Programs=com exe. Add a space at the end of the line and type scr. Save the file, and exit Windows. When you reload Windows, the change will take effect. Then create a new program item in the Main group: Select File, New, Program Item. Type Instant Saver in the Description box, and click on the Browse button to look for a screen saver (any SCR file in your Windows directory). Double-click on the desired filename, type a space following that filename in the Command Line box, and add /S (for "save now"). Click in the Shortcut Key box, and press S to create the hotkey Ctrl-Alt-S. Click on OK to exit. From now on, whenever you need to hide your screen, just press Ctrl-Alt-S.

JOSHUA LUBOSHITZ
EL PASO, TEXAS

LEGIBLE TEXT

Problem: *You lose characters when you run your DOS communications program under Windows.*

Solution: Try setting a smaller font size. Your video hardware will be able to draw the window more quickly and you'll lose fewer characters. To do that, click on the windowed communications program's control menu (the dash-like button at the left of the title bar), select Fonts, and select a

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smaller size than the one displayed. You may need to experiment with these settings to get optimal results.

DYLAN TWENEY
SANTA BARBARA, CALIFORNIA

OPEN PCXs IN PAINTBRUSH

Problem: *Paintbrush's File, Open dialog box defaults to looking for BMP files, requiring an extra step when you're trying to open PCX files.*

Solution: To make Paintbrush's File, Open dialog look for PCX and BMP files in one sweep, edit Paintbrush's executable file, PBRUSH.EXE. Before you start, make a copy of PBRUSH.EXE to PBRUSH.BAK in File Manager. Then launch Windows Write to open PBRUSH.EXE from the Windows directory. Next, click on the No Conversion button to prevent Write from converting the binary file to WRI format. Write will open a file containing very little text and a lot of unreadable characters. Select Find, Replace. In the Find What box, enter *.DIB and in the Replace With box, enter *.PCX. Check the Match Case box, then click on the Replace All button. When the job is finished, press the Close button to return to the editing window, select File, Save and then exit Write.

You have just altered the code so that instead of looking for DIB (device independent bitmap) files and BMP files, Paintbrush's default File Open setting automatically lists all the files in the default directory with both BMP and PCX extensions. Run the newly edited program and, if it doesn't crash your system, delete the backup file PBRUSH.BAK.

MATTHEW LAKE
SENIOR EDITOR

DOS DISPLAY

Problem: *You need to squeeze some more display into a DOS session under Windows.*

Solution: There are two options, depending on whether the DOS session is running as a full screen or in a window. For full-screen mode, you can display more than the standard 25 lines of text by entering the line ScreenLines=43 under the [NonWindows] section of SYSTEM.INI. Applications set for 25-line display will continue to run normally, but DOS command-line sessions and text applications configured for 43- or 50-line display will be affected.

For Windowed sessions, click once on the Control Menu (the leftmost button on the title bar), select Fonts, and select a configuration according to the preview screen. That font selection won't apply when you switch to full-screen mode (by pressing Alt-Enter).

LENNY BAILES
SAN FRANCISCO, CALIFORNIA

PRACTICAL WALLPAPER

Problem: *You want to display commonly used phone numbers on your screen.*

Solution: Get rid of the Post-it notes on your monitor. Put those phone numbers on your wallpaper. Create a phone list in your word processor, apply any fonts and colors you like, but remember that the entire list must fit on one screen. Select the text, copy it to the Clipboard, launch Paintbrush, and select Edit, Paste. Save that image as a BMP file, and set it as your active wallpaper from the Desktop configuration menu in the Control Panel.

NORMAN FRANK
MONTGOMERY, ALABAMA

SWAP PROBLEMS

Problem: *When you select Virtual Memory to set up a permanent swap file, Windows displays a small maximum size for the swap file. You know that you have much more space available on the disk, so what's wrong?*

Solution: Permanent swap files require contiguous disk space, but your hard disk is probably fragmented, rendering the available space useless for creating a swap file. Exit Windows and defragment the disk with Defrag (MS-DOS 6.x), or with a third-party utility such as SpeedDisk in the Norton Utilities or Compress in PC Tools. Next time you run Windows and attempt to set up a permanent swap file, you'll find more disk space available.

LENNY BAILES
SAN FRANCISCO, CALIFORNIA

WALLPAPER GLUE

Problem: *The only wallpaper placement options are Tiled and Centered, but you want to anchor the bitmap to a specific location on the screen.*

Solution: Edit WIN.INI and add these entries under the [Desktop] heading:

```
WallpaperOriginX=n
WallpaperOriginY=n
```

where X refers to horizontal position and Y is the vertical one. Experiment with different values for n, which stands for a number of pixels. For example,

```
WallpaperOriginX=50
WallpaperOriginY=100
```

will set the location of the wallpaper at 50 pixels from the left margin and 100 pixels from the top margin.

LENNY BAILES
SAN FRANCISCO, CALIFORNIA

HOT TIP ALTERNATIVE STARTUP

Problem: You need to hide the contents of your StartUp group from the eyes of curious colleagues.

Solution: If you share your system with others, or if the office hacker wannabes always modify your favorite startup configuration, there's a simple solution. Create a new Program Manager group and call it something nonrevealing like Work Procedures. Enter WORKPROC.GRP for the filename. Drag and move all the icons from the StartUp group to this new one, and minimize both windows. Then launch Notepad, open PROGMAN.INI, and add the line STARTUP=WORKPROC under the [Settings] heading. Save, exit, and reload Windows. The PROGMAN.INI line tells Windows to override the default StartUp group.

YAEL LI-RON
HELP EDITOR





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THE DEADLY SINS OF STARTUP CONFIGURATION

Bring Your Old AUTOEXEC File up to BAT

Take a look at the AUTOEXEC.BAT file listed in "Spot the Sins in AUTOEXEC.BAT," below. Looks pretty reasonable, doesn't it? It may not be all that different from the AUTOEXEC.BAT file on your PC. Yet it contains five mistakes that impede your system's speed and effectiveness. These mistakes are so common that I've come to call them the deadly sins of AUTOEXEC.BAT processing. If you can spot them, you have every right to call yourself a bona fide DOS guru. If you can't, follow along as we discuss the pitfalls of this AUTOEXEC.BAT file, and then check to make sure that yours doesn't suffer from the same mistakes.

Environment Variables The file in "Spot the Sins in AUTOEXEC.BAT" contains nine commands that create environment variables: PATH, APPEND, and seven SET commands. It also contains five commands that load memory-resident programs (TSRs): SMARTDRV, MSCDEX, MOUSE, VDESK, and BIGBUF. So far, standard fare.

The problem is the order of the commands. Like many AUTOEXEC.BAT files, this one executes SET commands and other commands that create environment strings before it loads any TSRs. This often results in wasted memory because when DOS loads a program, it allocates an extra block of memory to hold a copy of all the currently defined environment strings. This memory block, called a *local environment block,* becomes the private property of the program. The more environment strings there are, the larger the environment block. Unless a TSR releases its environment block before becoming resident in memory, the environment block, too, remains in memory. To avoid the risk of wasting memory, place commands that load TSRs *before* commands that create environment variables. This will minimize the sizes of the environment blocks DOS sets aside for the TSRs and reduce the impact of unreleased environment blocks.

Dead-End PATH The PATH command also suffers from a common malady: It lacks the drive letters required to spell out full and unambiguous paths to program files. Assuming all the directories named in the PATH command are on drive C:, the command should read like this:

```
PATH C:\DOS;C:\WINDOWS;⊃
⊂C:\WINWORD;C:\QUATTRO;⊃
⊂C:\ACAD;C:\UTILS;C:\SBPRO
```

Here's why. When DOS searches the directories named in the PATH environment variable for an executable file, it uses the directory names just as you entered them. Suppose you type XCOPY at the command prompt to invoke XCOPY.EXE from C:\DOS. If C: is the default drive, then DOS locates the program file without a problem. But if the default drive is anything other than C:, DOS doesn't know that it's supposed to look for the \DOS directory on drive C: because you failed to specify a drive letter in the PATH command. It will look on the default drive instead.

There's a simple fix: Always include drive letters in your PATH command and you won't have this problem.

End the APPEND This command is among the least useful DOS commands. Its function is to provide DOS with a PATH-like access to data files. Here are three reasons you should never use APPEND:

1. APPEND is probably responsible for more inexplicably lost files than any other DOS command. If a program opens a data file in a remote directory without supplying a PATH name and APPEND magically allows it to happen, and if the file is then modified and saved, it is likely to be saved to a different directory from the one it came from. Unless you're very astute, it will appear that the changes were lost when you go back and open the file again.

2. As a TSR, APPEND takes memory away from your application programs.

3. APPEND does nothing for you that proper habits and hard disk organization won't. The classic way to organize a hard disk is to create subdirectories for your application programs and separate subdirectories for documents and data files. Add the directories containing executable files to the Path and CD to a data directory before starting the associated application program. Now all the data files you need are in the

SNAPSHOT SPOT THE **SINS** IN AUTOEXEC.BAT

Read over this AUTOEXEC.BAT. If you can spot the five deadly sins, pat yourself on the back. You're a DOS guru. See page 234 for the streamlined version.

```
@ECHO OFF
PATH \DOS;\WINDOWS;\WINWORD;\QUATTRO;\ACAD;\UTILS;\SBPRO
APPEND \WINWORD\DOC;\QUATTRO\DATA;\ACAD\DRAWINGS /PATH /E
SET PROMPT=$P$G
SET SOUND=C:\SBPRO
SET BLASTER=A220 I5 D1 T4
SET TEMP=C:\WINDOWS\TEMP
SET ACAD=F:\ACAD\SUPPORT;F:\ACAD\FONTS;F:\ACAD\ADS
SET ACADDRV=F:\ACAD\DRV
SET ACADCFG=F:\ACAD
SBP-SET /M:12 /VOC:12 /CD:12 /FM:12
SMARTDRV 1024 512
MSCDEX /D:ASPICDO /M:16 /L:D
MOUSE
VDESK /VSIZE=16
BIGBUF 64
```

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WORKAROUND THE STREAMLINED VERSION

Here's the corrected version of the code in "Spot the Sins in AUTOEXEC.BAT," page 232. When you apply our rules, you'll get fewer headaches.

```
@ECHO OFF
C:\DOS\MSCDEX /D:ASPICD0 /M:16 /L:D
C:\DOS\SMARTDRV 1024 512
C:\DOS\MOUSE
C:\UTILS\VDESK /VSIZE=16
C:\UTILS\BIGBUF 64
PATH C:\DOS;C:\WINDOWS;C:\WINWORD;C:\QUATTRO;C:\ACAD;C:\UTILS;
C:\SBPRO
SET PROMPT=$P$G
SET SOUND=C:\SBPRO
SET BLASTER=A220 I5 D1 T4
SET TEMP=C:\WINDOWS\TEMP
SET ACAD=F:\ACAD\SUPPORT;F:\ACAD\FONTS;F:\ACAD\ADS
SET ACADDRV=F:\ACAD\DRV
SET ACADCFG=F:\ACAD
C:\SBPRO\SBP-SET /M:12 /VOC:12 /CD:12 /FM:12
```

current directory. If you need to access files in a remote directory, spell out the PATH to them. Then you can be sure that a modified file will be saved back to the same location.

SmartDrive and MSCDEX Beginning with MS-DOS 6.2, SmartDrive—MS-DOS's built-in disk cache—will cache CD-ROM data as well as floppy-disk and hard-disk data. Caching can easily double the apparent speed of CD-ROM drives, which are notoriously slow to begin with.

When it starts, SmartDrive examines all the drives in your system and sets up default caching parameters for each. But until MSCDEX is loaded, DOS—and therefore SmartDrive—doesn't recognize that a CD-ROM drive exists. So if SmartDrive is loaded before MSCDEX, as in this example, your CD-ROM drive won't enjoy the benefits of disk caching. The solution: Reverse the order of the SMARTDRV and MSCDEX commands so that MSCDEX comes first.

External Path This is subtle, but important nonetheless. None of the external commands in this AUTOEXEC.BAT file—SBP-SET, SMARTDRV, MSCDEX, MOUSE, VDESK, or BIGBUF—is prefaced with a path name. All the program files named in these commands are stored in directories that are in your path, so path names are redundant, right?

Wrong. It takes time for DOS to search the directories named in the PATH environment variable for executable files. The command C:\UTILS\BIGBUF will execute faster than plain BIGBUF because DOS will know exactly where to go to find BIGBUF. It won't have to waste time checking all the directories whose names appear before C:\UTILS in the PATH command. Prefacing external commands with path names can easily shave a second or two off the time required to execute AUTOEXEC.BAT.

"The Streamlined Version," (above) lists an improved version of the AUTOEXEC.BAT file covered in "Spot the Sins in AUTOEXEC.BAT," page 232. The differences are minor, yet this version will execute faster and go away leaving you with a more robust configuration.

JEFF PROSISE is not only your DOS guru, he's also the author of Windows Desktop Utilities *(ZD Press, 1994).*

PC Contact QUICK CALCULATOR

Command Line Arithmetic
No sooner have you exited Windows than you need to use a calculator. C is a command line utility that turns your DOS prompt into a quick and dirty calculator. Type C 576 * 320 and the result appears at the next prompt. You can download C.ZIP from PC Contact's data library 3 (Utilities/Misc.) or mail $5 to Tom Wilson, 3172 18th St. NW, Washington, DC 20010. See page 262 for information on ordering disks from Public Brand Software.

DOS TIPS

END OF FILE MARKER

Problem: *A file seems to be truncated or corrupted.*

Solution: If you ever open a spreadsheet or other file and find that you're missing most of the data, it's possible that an end-of-file marker has somehow been inserted into it.

You wouldn't expect one character to cause you to lose half your spreadsheet, yet the EOF marker can do just that. Downloads from e-mail, exported files, and other working files often contain the EOF character, ASCII 026—usually shown as ^Z or a right-pointing arrow.

Usually, it's where you'd expect it to be—at the end of the file—but if you merge files together, those little arrows could be anywhere in the file. DOS commands—such as FIND, SORT, and MORE—and other programs simply stop when they reach the character.

It's possible to redirect or otherwise edit a merged file and lose most of your data. So before you run DOS-based commands on such files, open them in a text editor and check for the ASCII 026 character, and remove all instances except the one at the very end of the file. Or use the Norton Utilities' FileFix utility, which does it all for you, in a safer environment.

SAUL P. MORSE
ORLANDO, FLORIDA

HIDDEN DIRECTORIES

Problem: *You want to keep certain directories safe from snoops.*

Solution: Here's a quick way to hide directories from unauthorized prying eyes: Name them using the null character, ASCII 255. To create a directory, type MD Alt-255 (you may repeat the Alt-255 up to eight times, plus three in the extension). To further

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ward off the snoops, hide the directory by typing ATTRIB *directory name* +H. You're safe not only in DOS: In the Windows File Manager, though users can view hidden files, double-clicking on a directory named with the null character throws them back to the root directory and doesn't give them access to the directory itself.

NORMA AIELLO
SANTA FE, NEW MEXICO

NO NEED FOR DOUBLE BUFFER

Problem: *The SMARTDRV line appears twice in your startup files—once in the AUTOEXEC.BAT and once again in the CONFIG.SYS, with the /DOUBLE_BUFFER parameter after it. You don't know if you need both.*

Solution: You need double buffering only if your system has a SCSI, ESDI, or Micro Channel architecture (MCA) hard disk and you run Windows in 386-Enhanced mode. MS-DOS 6.*x* often adds the double-buffer option to your CONFIG.SYS file during its installation, but you may not necessarily need it. To see if you need double buffering, type SMARTDRV at the DOS prompt and look at the buffering column. If all the entries in that column are "no," remove the DEVICE=SMARTDRV.EXE /DOUBLE_BUFFER line from your CONFIG.SYS. This may even speed up some of your hard disk's operations.

SCOTT NAYLOR
ASSOCIATE TECHNICAL EDITOR

DEMYSTIFY ANSI

Problem: *You never remember ANSI key assignments.*

Solution: The ANSI.SYS driver enables you to reassign keys using escape sequences from a batch file for such special effects as colors and beeps. To generate the escape code, open EDIT (in MS-DOS 5.0 or higher), and enter the escape character by first pressing Ctrl-P, then the numeric value specified in the manual. Then use the following escape string syntax to assign different characters to particular keys:

← [*code;newkey;code;newkey;p*

The *newkey* parameter speaks for itself; the code parameter is more complicated. The DOS manual devotes three pages to a table of ANSI key codes, and prefaces it with the warning that not all these codes are correct for all PCs.

So don't go scurrying off for a manual every time you need to use ANSI codes in your batch files. Instead, run the following batch file and short DEBUG program to get DOS to do the work for you. First, use a text processor to create the following script, then save it as KEY.SCR in your batch or utilities directory.

```
A
MOV SI,0080
MOV CX,[SI]
XOR CH,CH
JCXZ 115
MOV AH,0
INT 16
CMP AL,0
JNZ 109
MOV AL,AH
JMP 119
MOV AH,0
INT 16
MOV AH,4C
INT 21
N KEY.COM
RCX
1D
W
Q
```

Close the text processor and type DEBUG < KEY.SCR to compile KEY.COM. Now reopen your text processor, type the following batch file, and save it as ANSICODE.BAT.

```
@ECHO OFF
SET X=
REM This is ANSICODE.BAT,
REM which reports ASCII key codes
ECHO Press any key . . .
KEY
:TOP
IF ERRORLEVEL 0 IF NOT
ERRORLEVEL 1 SET X=Y
IF NOT %X%!==Y! GOTO SKIP
ECHO Please press that key again . . .
KEY /F
:SKIP
FOR %%A IN (0 1) DO
IF ERRORLEVEL %%A00
SET F=%%A
FOR %%A IN (0 1 2 3 4 5 6 7 8 9)
DO IF ERRORLEVEL %F%%%A0
SET F=%F%%%A
FOR %%A IN (0 1 2 3 4 5 6 7 8 9)
DO IF ERRORLEVEL %F%%%A
SET F=%F%%%A
IF %X%!==Y! SET F=0;%F%
SET X=
ECHO The code is %F%. Press
another key, or press Esc to quit . . .
KEY
IF ERRORLEVEL 27 IF NOT
ERRORLEVEL 28 GOTO END
GOTO TOP
:END
SET F=
```

To discover any key's ANSI code, enter ANSICODE at the command line, and follow the batch file's prompts.

SAUL P. MORSE
ORLANDO, FLORIDA

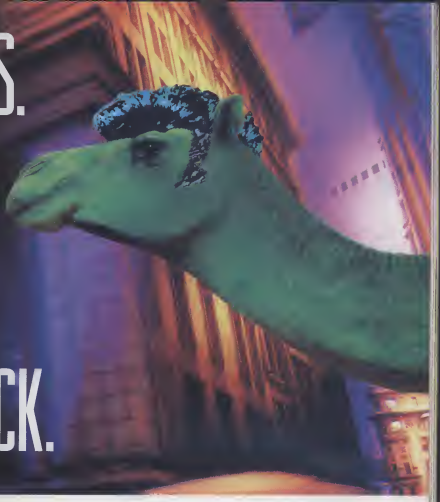
HOT TIP GET THE MOST OUT OF UPPER MEMORY

Problem: Some TSRs won't load into upper memory.

Solution: After running MemMaker, you may find that some device drivers and TSRs—MOUSE.COM, McAfee's VSHIELD, the Intel SatisFaxion drivers, and others—load below 640K instead of into upper memory, despite the fact that the DOS MEM command reports sufficient upper memory to be available. The reason is that these utilities initially request two to three times as much RAM as they actually occupy when they become resident. MOUSE.COM, for instance, requests 57,200 bytes initially, but leaves a resident stub of only 17,088 bytes. Often, you can make an exploding driver load high by bumping up its position in the CONFIG.SYS or AUTOEXEC.BAT. Make MOUSE the first entry in the AUTOEXEC.BAT, or switch to the MOUSE.SYS device driver placed in the CONFIG.SYS. Run MemMaker again, and odds are that this time there will be sufficient room to place the driver in upper memory.

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Among some of the most feared terms in the English language you'll find: Ledger, Journal, Debit, Chart of Accounts, Assets, and, worst of all, FIFO. These are largely to blame for the fact that many businesses, though otherwise computerized, tend to delegate their bookkeeping to expensive outside services. Or, worse yet, they still maintain a paper-based system. Unlike word processing or spreadsheet use, accounting is a profession you must acquire before using an accounting software package. The question is not whether you can find a specific feature, but whether you know what it means. A manual may help you find the feature or keystroke you're looking for, but if you don't understand why you need to maintain a chart of accounts, the program is practically worthless. A good example is Peachtree Accounting for Windows, one of the more popular accounting programs around, which, despite its enhanced usability features, is very intimidating for the nonaccountant.

Quick Fix Of all the accounting packages on the market, high- and low-end, only one manages to shield the user from the professional jargon while still maintaining the books. Intuit's QuickBooks (for DOS and Windows) is an excellent choice for business owners and managers who are morbidly intimidated by accounting terminology. Another product from Intuit, QuickPay, is a payroll module that often comes bundled with QuickBooks. For a small business or nonprofit organization, the QuickBooks/QuickPay bundle is an elegant remedy for accounting headaches, even those terrible taxes. If you can account for every transaction, you can file your income tax and sales tax reports. Generate all the necessary reports, hand them over to your tax preparer, and you're done. If you do your own taxes, QuickBooks is closely linked with TurboTax (now owned by Intuit), so data can be converted easily between the two programs.

Quicken is another Intuit offering that can do some of this job for you. Though traditionally considered a "home" product, (it's the original homeware) this personal-finance program is widely used as a small-business accounting program. At the core lies a checkbook metaphor, allowing you to post payments and log income. For a street price of about $20, it makes a lot of financial sense.

Better Yet . . . If you're tired of learning a new program for every specific business task, consider this: Use a spreadsheet for your basic accounting needs. After all, a spreadsheet is just columns and rows of numbers and other data, and you probably use one already, so there's nothing new to learn or buy. Whether your spreadsheet is one of the top three—Microsoft Excel, Lotus 1-2-3, or Novell's Quattro Pro—or even a "works" package, such as Microsoft Works or Claris Works, you already have all the tools you need for keeping your books in order, maintaining a small payroll, even managing your inventory.

Of course, as soon as your business grows to a point where "real" accounting is necessary, you won't have to worry about learning accounting principles, because you'll be able to afford an accountant. You know, someone who knows the true meaning of FIFO, and what's more, loves this stuff.

YAEL LI-RON

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TIPS WORD PROCESSORS

WORD 6.0 FOR WINDOWS

Problem: *You need a quick way to switch between open documents.*

Solution: You can use the Window menu to select another open Word document, but to speed things up, write yourself a few short keyboard macros to do it. Here's how: Select Tools, Macro, type SwitchToDoc1 for the name, click on Record, Keyboard, check the Press New Shortcut Key box and press a hotkey combination, such as Ctrl-1. This hotkey is preassigned to Paragraph Single Space, so if you want to keep that assignment, select another hotkey. Click on Assign, Close, and select Window, 1. Click on the Stop Record button. Repeat the process for SwitchToDoc2, SwitchToDoc3 and so on, and add to the hotkey value (Ctrl-2, Ctrl-3, and so on). You've just created a "Boss Key," whereby you can quickly conceal a personal document by switching to an official-looking one when anybody approaches your desk.

CHRIS SANDLUND
ASSOCIATE EDITOR

Problem: *You often create training manuals and user guides, and you need a quick way to insert a carriage return symbol into your document.*

Solution: Such a symbol exists. To access it, create a hotkey. Select Insert, Symbol, click on the carriage return symbol, select Shortcut Key, and press Ctrl-Alt-Enter in the Press New Shortcut Key box. Click on Assign, then on Close. Whenever you need to insert the carriage return symbol, just press that hotkey.

MATTHEW LAKE
SENIOR EDITOR

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Over 20 Productivity Features

Why even consider the competition's stripped down graphics boards, when you can get the most advanced and comprehensive set of Windows and CAD productivity features for free?

MGA PowerDesk 2.0 Features

- Instant Modeswitch for on-the-fly resolution and color depth switching without restarting Windows
- Pixel Touch hardware pan and zoom
- QCDP true color simulation in 8 and 16-bit modes
- Virtual Desktop sizes up to 1600 x 1200
- Monitor Selection
- Center Pop-UpandCenter Window
- MaxVIEW
- PanLock
- Quick Access
- 3D Screen Saver

DynaView 2D AutoCAD Features

- Double buffered Spy Glass and Bird's Eye views
- Windows-like Scroll and Zoom bars
- Resizeable and repositionable Main Window
- Scrollable Text Window
- Programmable pop-up Iconic Menus and Tool Strip

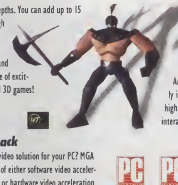
DynaView 3D AutoCAD Features

- Interactive 3D movement and rotation
- Instantaneous Gouraud shaded rendering
- Real-time 3D rendered walkthroughs and fly-bys

Plus

The Future Built In

With MGA Impression Plus, you won't need to change your graphics accelerator every six months because the future is already built in. You can upgrade your 2 MB VRAM PCI board to 4 MB of VRAM for added speed, resolutions and color depths. You can add up to 15 VM-Channel based peripherals through MGA's Video XL upgrade module. And because MGA supports standard 3D APIs such as, 3DR, Open GL, HOOPs and VAGI, you'll be able to take advantage of exciting new 3D software applications and 3D games!



Plus

Superior Video Playback

Looking for a low-cost, high quality video solution for your PC? MGA Impression Plus gives you the option of either software video acceleration through Microsoft DCI support, or hardware video acceleration with MGA Video XL for the smoothest, photo-realistic video playback at ultra-high resolutions.

- 30 frames per second with Microsoft DCI software video playback
- Video XL upgrade module gives you:
  - 1280 x 1024 at 30 frames per second video playback
  - Resolution scaling using Pixel Interpolation for high quality, full screen video playback
  - Color space conversion from YUV to RGB



Plus

3D For Free

Why pay more for 3D? MGA Impression Plus is the only graphics accelerator on the market that offers powerful 3D acceleration for the price of a 2D board!

By accelerating 3D directly in hardware, MGA Impression Plus frees your CPU of computing-intensive rendering functions, allowing you to not only display - but interactively manipulate complex 3D drawings in real-time. You can then pan, zoom, slice and walk through your 3D models at resolutions as high as 1152 x 882. That's the same level of 3D performance as dedicated work-stations from Silicon Graphics!



Plus

Free 3D Games Pack

Now you can play arcade-quality 3D games right from your PC! MGA Impression Plus is bundled with thrilling new interactive, real-time 3D games created specifically to take advantage of MGA's powerful 3D graphics engine. And by accelerating the rendering process directly in hardware, MGA Impression Plus gives you higher frame rates, more bad guys, and harder interactive punches!

June 28, 1994

MGA Impression ISA	MGA Impression VL-Bus	MGA Ultima Plus VL-Bus	MGA Ultima Plus PCI	MGA Ultima Plus 2MB PCI
PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE	PC MAGAZINE EDITORS' CHOICE

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Winbench 4.0 scores based on 4 MB PCI boards using a Pentium®-90 16 MB RAM 256KB cache ©1994 All rights reserved. Matrox, Matrox MGA, Matrox QCDP, Matrox Instant Modeswitch are registered trademarks of Matrox Electronic Systems Ltd.

Notes:
[1] Price for the MGA Impression Plus with 2MB VRAM, PCI local bus
[2] Speed performance based on results of a 4 MB PCI board using .28 Swiss WinBench 4.0 on a Pentium®-90, 16 MB RAM, 256KB cache, 1024 x 768 x 256 colors
[3] Requires 4 MB of VRAM

matrox

Circle 155 on reader service card.

WORDPERFECT 6.0 FOR WINDOWS

Problem: *In WordPerfect 6.0a for Windows, character spacing is different from that in the first release of WordPerfect 6.0 for Windows.*

Solution: In previous versions of WordPerfect for Windows, there were two types of metrics used to determine the position of characters onscreen and on the printed page. The Screen Metrics determined the position of the characters on screen, while the Printer Metrics determined the position on the printed page. In the past, WordPerfect's customer support department received numerous complaints that WordPerfect for Windows was not truly Wysiwyg because the position of text on screen, according to the Ruler position, did not match the position indicated on the Status Line or printed page. In most cases, WordPerfect for Windows would wrap at position 6.5 inches, according to the Ruler, when the Status Line would show the wrap starting at position 7.5 inches.

To correct this, WordPerfect 6.0a for Windows now uses Printer Metrics to determine the position of characters both on the screen and on the printed page. This results in true Wysiwyg because the text wraps at 7.5 inches according to both the Ruler and the Status Line. However, there are side effects with this feature. First, characters may appear to "wiggle" while you're typing. Also, when using low screen resolutions, such as 640 by 480 (VGA), you may notice more space between some characters on screen, but they will print correctly. If you find this annoying, there's a new /DM=S startup option that tells WordPerfect 6.0a for Windows to switch back to using Screen Metrics instead of Printer Metrics to position characters on the screen (text alignment will look like the initial version of WordPerfect for Windows). This fixes the character wiggles and extra spaces between some characters.

WordPerfect Corporation
Customer Support

TIPS SPREADSHEETS

QUATTRO PRO 5.0 FOR DOS

Problem: *You want to display a grid in your worksheet.*

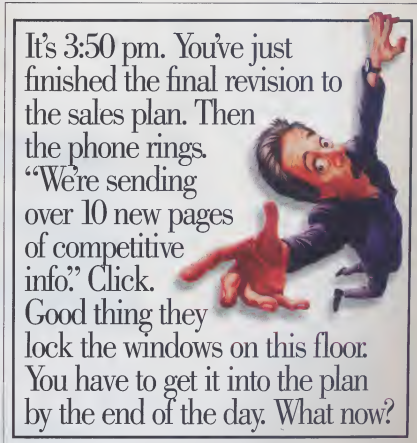
Solution: Quattro Pro does not automatically set up a grid. If you want a grid option, add it to the SpeedBar, as follows: Select Options, SpeedBar, Ready mode SpeedBar. Examine the predefined buttons, and find one you never use. For this example, we'll use button H (Del). Click on it, and click on Short name to rename it. Type GRD (you're allowed only 3 characters) and press Enter. Select Long name, type Grid,

HOT TIP WORD FOR WINDOWS

Problem: You need a fast way to update several documents to a new template that contains new printer and font information.

Solution: One way is to select Format, Style and go to the Style Organizer to copy the modified styles from the document template into the document. However, there is a quicker and easier way. First, select the File menu and then click on Templates. Enable "Automatically Update Document Styles" and click on OK. This will automatically copy all the new files from the document template to the document. If you want to do this only once to refresh the document styles, you'll need to repeat the process to turn this option off, otherwise it will be repeated each time you load the document.

RONNY RICHARDSON
CHAMBLEE, GEORGIA



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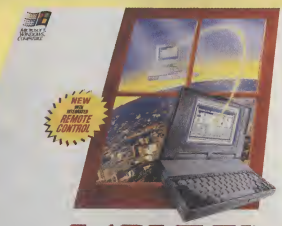
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and press Enter. Click on Macro, delete the existing entry, type /WOGD and press Enter. Press Esc three times, and select Update. A Grid button has been added to your SpeedBar, and you can click on it whenever you want a grid in your worksheet.

Noah F. Dickinson
Florham Park, New Jersey

MICROSOFT EXCEL 5.0

Problem: *AutoSum requires an annoying extra step for confirmation of the range to sum.*

Solution: If the range you want to sum is immediately above the cell with the Sum formula, double-click on the AutoSum button to bypass the confirmation step.

Kimberly Pace
Antioch, California

Problem: *You want to define a selected area as a print area.*

Solution: You can do this through the Excel menus, but here's a better way: Activate a toolbar button to perform this job. Right-click on the toolbar, select Customize, and click on File. The first button from the right is the "Set Print Area" button. Drag it to the toolbar, and you're set. From now on, whenever you want to designate a print area, select that area first and then click on the button.

Sebastian Rupley
Features Editor

Problem: *You're entering the same data over and over again.*

Solution: Select the area for the repetitious data entry, type the information, and press Ctrl-Enter to enter it in all the cells in the selection. If the typing area is not contiguous, Ctrl-click on each cell you want to include in the selection.

Zachary Howard
Portland, Oregon

Problem: *The File, Open menu lets you open only one worksheet at a time.*

Solution: Not so. Ctrl-click on each file you want to open, press OK, and Excel opens all of them, in separate windows. When you want to close all the open files at the same time, hold down the Shift key and click on File. This adds Close All as a temporary new option to the File menu.

Zachary Howard
Portland, Oregon

HOT TIP LOTUS 1-2-3 FOR DOS

Problem: You've entered a formula correctly, but it yields the wrong result.

Solution: There's a possibility that numbers referenced were entered as labels (with a right-align prefix) rather than as values, which makes them hard to distinguish. You can play detective and identify those offending entries. Assuming that your data starts in cell A5, type the following formula in B5:

```
@IF(@CELL("PREFIX",A5)=
"","Label","Value")
```

Copy the formula down to cover the entire range in column A. You can now edit any cell identified as Label.

ZACHARY HOWARD
PORTLAND, OREGON

TIPS DATABASES

PARADOX 4.5 FOR WINDOWS

Problem: *A file referenced in a Paradox query has been renamed, so you get an error message when you attempt to run the query.*

Solution: Paradox queries are just text files, which are easily editable in Notepad or other text editors. Open the query file in your editor (look for a file with the extension QBE) and modify the name of the table referenced in it.

John Freehling
Hollywood, Florida

You think she's finishing the proposal. She thinks you are. Surprise, neither one of you are. And it's 4 hours before the grant committee meets. Let's see, 16 new pages of data, 11 article reviews, 3,600 words sent by your partners in Istanbul. Who can type faster? Aaargh! What now?



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DBASE IV

Problem: *You need a routine that tests for the existence of a DOS directory and renames it from within a dBASE program.*

Solution: The following User-Defined Function (UDF), called Directory(), accepts a directory name as a parameter and returns .T. if the directory exists, or .F. if it doesn't. If you type the names of two directories, Directory() will attempt to rename the first with the second, returning .T. if it succeeds, .F. if it does not.

```
FUNCTION Directory
PARAMETERS pdir1,pdir2
PRIVATE mdir1,mdir2
DO CASE
CASE PCOUNT() = 0
CASE TYPE("pdir1") <> "C"
CASE .NOT. FILE(pdir1+"\NUL")
CASE PCOUNT() = 1
RETURN .T.
CASE TYPE("pdir2") <> "C"
CASE FILE(pdir2+"\NUL")
CASE pdir1 = pdir2
OTHERWISE
mdir1 = LEFT(pdir1,RAT("\",pdir1)-1)
mdir2 = LEFT(pdir2,RAT("\",pdir2)-1)
IF mdir1 = mdir2
RENAME &pdir1 TO &pdir2
RETURN .T.
ENDIF
ENDCASE
RETURN .F.
```

The second UDF, Rat(), is for users of dBASE IV Versions 1.1 and 1.5 only. You don't need it if you have Version 2.0, which has an internal RAT() function. If you don't already have a procedure file, create a new one. At the dot prompt, type MODIFY COMMAND MYPROX and type the following lines into the resulting UDF:

```
FUNCTION Rat
PARAMETERS sub_str,string
PRIVATE sub_len,ctr,rat_pos
sub_len = LEN(sub_str)
ctr = LEN(string) + 1
rat_pos = 0
DO WHILE ctr > sub_len
IF SUBSTR(string,(ctr-
sub_len),sub_len) = sub_str
rat_pos = ctr - 1
EXIT
ELSE
ctr = ctr - 1
ENDIF
ENDDO
RETURN rat_pos
```

As MYPROX is a procedure file, you need to activate it by typing SET PROCEDURE TO MYPROX. The following command line examples show a successful directory name test and two attempts to rename a directory. The first attempt fails because only the last branch of a directory tree can be changed.

```
. ? Directory("C:\ACCOUNTS")
. .T.

. ?
Directory("\PAYROLL\FILES","\PAY
\DOCS")
. .F.

. ? Directory("\PAYROLL\FILES","\
PAYROLL\DOCS")
. .T.
```

ROGER W. SAUER
FAIRFIELD, CALIFORNIA

Problem: *You need a program that converts decimal values to their hexadecimal equivalents.*

HOT TIP — DBASE 5.0 FOR WINDOWS

Problem: You want dBASE to run a program (PRG) as soon as it launches.

Solution: Older versions of dBASE for DOS allowed you to specify the default opening program by adding the line COMMAND=DO [program name] in the CONFIG.DB file, but dBASE for Windows uses an INI file (DBASEWIN.INI) that doesn't include that option. To overcome this, change the Properties for the dBASE for Windows icon in Program Manager, as follows: Alt-double-click on the program's icon, and in the Command Line box, press End to get to the end of the command. Type a space, then specify the full path and program name for the program you want to run.

JOSHUA LUBOSHITZ
EL PASO, TEXAS

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Solution: Write a UDF. If you don't already have a procedure file, create a new one. At the dot prompt, type MODIFY COMMAND MYPROX and the following lines:

```
FUNCTION Dec2Hex
PARAMETERS dec_num
PRIVATE ctr,hex_num,ascii
IF TYPE("dec_num") <> "N"
RETURN "0"
ENDIF
dec_num = INT(dec_num)
IF dec_num < 10
RETURN IIF(dec_num <
1,"0",LTRIM(STR(dec_num)))
ENDIF
DECLARE
Remainder[LEN(LTRIM(STR(dec_
num)))]
ctr = 0
DO WHILE dec_num > 0
ctr = ctr + 1
Remainder[ctr] = MOD(dec_num,16)
dec_num = INT(dec_num / 16)
ENDDO
hex_num = ""
DO WHILE ctr > 0
ascii = IIF(Remainder[ctr] <
10,48,55)
hex_num = hex_num + CHR(ascii
+Remainder[ctr])
ctr = ctr - 1
ENDDO
RETURN hex_num
```

MYPROX is a procedure file, so you need to activate it by typing SET PROCEDURE TO MYPROX. To calculate the hex value of any decimal number, type ?DEC2HEX(*n*). For example, ?DEC2HEX(59) yields 3B.

ROGER W. SAUER
FAIRFIELD, CALIFORNIA

TIPS ACCOUNTING

PEACHTREE FOR WINDOWS

Problem: *You need to switch from a cash-based company to an accrual-based one.*

Solution: You can't make that switch automatically, but here's a way around it. First, you must set up a New Company that is on the accrual basis. Once you've done that, select File, Export to move the Chart of Accounts, vendors, customers, employees, inventory items, and jobs from the cash-based company. You can't export journal transactions; they must be rekeyed because cash-basis transactions do not include Accounts Receivable and Payable (accrual-based ones do). In the new company, select File, Import to bring over this information.

By the way, the best time to switch is at the beginning of a year or quarter.

PEACHTREE SOFTWARE
CUSTOMER SUPPORT

QUICKBOOKS 2.0 FOR WINDOWS

Problem: *You need to change the check date at printing time.*

Solution: By default, checks print with the date of your data entry. To change that date to the date you actually print the check, select Preferences, Checks, click on



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Change check date when check is printed, then click on OK.

Intuit Corporation
Technical Support

Problem: *You want to rearrange the order in which accounts appear in reports.*

Solution: Select Lists, Chart of Accounts. Position the mouse pointer over the small diamond to the left of the account name you want to move. The mouse pointer becomes a 4-pointed arrow, indicating that you can drag the account up, down, left, or right. (If the account is already at the highest level—all the way to the left—the pointer will not show a left arrow, since you cannot drag the account in that direction.) Hold the mouse button down and drag the account to its new location. When you move an account that has subaccounts, the subaccounts move along with it.

Intuit Corporation
Technical Support

Problem: *Entering dates can be a very repetitive task.*

Solution: Use the following keyboard shortcuts for entering dates:

Next day: type + (plus)
Previous day: type - (minus)
Today: type T
First day of the week: type W
Last day of the week: type K
First day of the month: type M
Last day of the month: type H
First day of the year: type Y
Last day of the year: type R

Intuit Corporation
Technical Support

Problem: *Some reports are too wide to fit on paper, though there's little data in them.*

Solution: QuickBooks makes it easy to resize columns in reports. In fact, it works exactly as you'd expect. Just position the mouse pointer over the small diamond to the right of the header of the column you want to resize. The mouse pointer becomes a two-pointed arrow, indicating that you can drag the pointer left or right. Drag the pointer left or right until the column is sized correctly.

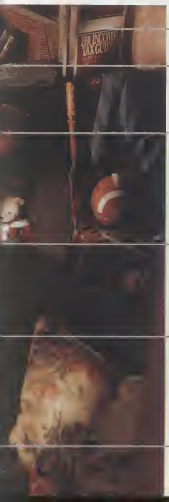
Intuit Corporation
Technical Support

DACEASY FOR WINDOWS

Problem: *You want a method for creating quotes that can be turned into sales orders easily.*

Solution: Use the Sales Order module to create quotes. When a customer requests a quote, create a sales order and add a comment such as "Prices on this quote effective through 12/94" in the shipping address field. Print and save. When the customer orders based on that quote, just change the quote to an order form by removing the comment and replacing it with a shipping address.

DacEasy
Technical Support



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A CLIENT A DAY...

Get NetWare Clients Up and Running

The line formed to the left. At its head was the Boss, steam rising majestically from his ears and nose. Chain saws and crowbars were a fashion *de rigueur* in the rest of the crowd. The steady *thump thump* of the battering ram on the door syncopated nicely with the chants of, "Death to the network manager. Death to the network manager." It was only a matter of time before the hinges gave way. Maybe you shouldn't have upgraded all the NetWare client software without testing it first.

OK, maybe it's not quite that bad, but you'll feel that way when even one user's Virtual Loadable Modules (VLMs) don't work. They're the new NetWare client thingies—they're supposed to save memory, run faster, raise productivity, and solve world hunger. What's that, you say? You're still running plain old NETX?

Maybe it's time to upgrade. It's free, and the new drivers will save memory and boost performance. On the other hand, don't fix what ain't broke. At least not without learning what can go wrong first (and there's a lot that can go wrong).

First Things If you're going to administer NetWare, consider a CompuServe account. Novell may overcharge terribly for the NetWare server software, but at least it gives away the client software. To get a CompuServe account, call (800) 848-8990. Once you're on, just type GO NOVFILES to see the most important downloads.

Alternately, if you're on the Internet, use anonymous ftp to get to Novell. Just ftp to ftp.novell.com and log in as anonymous. Most of the stuff you'll need as a NetWare user is in pub/netwire. A directory called novfiles contains the same stuff as the NOVFILES section of the Novell forum.

Whether you use CompuServe or the Internet, download DOSUP9.EXE and WINUP9.EXE right away. They're the latest DOS and Windows NetWare client software upgrades, respectively.

DOS Running network software under DOS is actually pretty simple. DOS isn't terribly intelligent when it comes to I/O, so the network drivers don't have to be, either. The one thing you must know is that when you install NetWare client software, the installation program will create a directory (by default called NWCLIENT), and stick all its files in there, including one called STARTNET.BAT. It then modifies AUTOEXEC.BAT with the line CALL \NWCLIENT\STARTNET.

This may be a problem, because MemMaker and some other memory managers won't optimize the CALLed batch file. To solve this problem, open AUTOEXEC.BAT and paste everything from STARTNET.BAT into it. Run MemMaker (or your favorite memory optimizer). You'll probably find that all your NetWare drivers can be loaded high. If you don't have a memory optimizer, try adding the command LH before each of the lines that load a NetWare driver. On occasion, there's some driver you can't load high (for example, on one system equipped with multiple protocols, I couldn't load FTP Software's TOKDRV high).

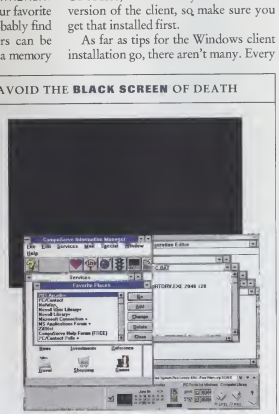
Windows When it comes to I/O, Windows is considerably more sophisticated. Consequently, you can get yourself into trouble when installing NetWare software. Take my word for it. Before you install your NetWare Windows client software, make backups of SYSTEM.INI and WIN.INI. This is always good practice when installing new software, but especially here: You can make Windows virtually unloadable if something goes wrong.

Perhaps the nicest tool that comes with the latest client software is NWUSER.EXE. With this little utility, you can map drives, log in to servers, attach to printers, and send messages to other NetWare users. Of course, it works only with the VLM version of the client, so make sure you get that installed first.

As far as tips for the Windows client installation go, there aren't many. Every

EXPERT TIP AVOID THE BLACK SCREEN OF DEATH

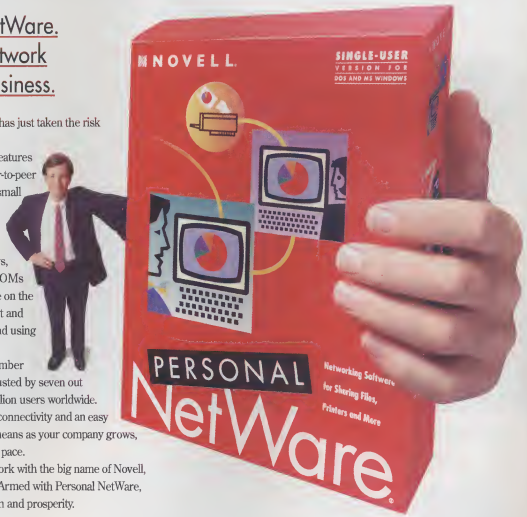
Lights Out: Does the world sometimes go black on you? It's probably the infamous Black Screen of Death—a strange interaction that occurs between Windows and NetWare when you're connecting to and disconnecting from multiple servers. There's not much you can do—unless you follow our advice and upgrade to the latest NetWare client software. You should find life a lot more colorful when you do.



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Circle 196 on reader service card.

WORKAROUND CONFIGURE MULTIPLE NICS

Mostly, ODINSUP is straightforward. But what happens when you need to run ODINSUP on more than one network interface card (NIC)? Here are the two things you need to know.

1. On the bind line of your NET.CFG file, follow the bind command with the number of the NIC you want to bind to. For example,

```
protocol ODINSUP
bind 3C523 2
```

will bind ODINSUP to the 3Com 3C523 that loaded second.

2. Follow PROTOCOL. You'll need a PROTOCOL.INI file if ODINSUP is bound to a NIC other than the first one loaded. It will probably look like this (in part):

```
[ETHERAND]
DriverName = DME0$
Bindings = x3C5232
```

Notice two changes to the standard 3C523 adapter's name. First, we added the letter x before its name. That's because it started with a number—can't have that. Second, we added the number 2 after its name to tell DME0$ to bind to the occurrence of 3C523 that loaded second.

system on which I installed the NetWare VLM software went up quickly and without a hitch. Trying to run it with other network protocols makes things slightly more interesting, but we'll save that for a later column.

OS/2 I can already see the slew of vicious mail that would arrive in my mailbox for the disparaging comments I'd like to make about installing the NetWare for OS/2 client software. Things like, "Why do you always pick on OS/2?" I'd respond, "I'm *not* picking on OS/2. If I were picking on OS/2, you'd know it."

I remember when I was trying to install NetWare on an IBM PS/2 Model 95 with an SMC Elite A card. It was running OS/2 2.1. I say "was" because at some point during the installation something went horribly wrong. Unlike Bill Bixby, who turned into the Incredible Hulk when anything went wrong, when something goes wrong for me, I turn into the Incredible Turkey. In a nutshell, when the installation finished, the system wouldn't boot. Instead it started to load network drivers and dumped its memory registers to the screen with the oh-so-helpful advice, "Call an IBM service representative."

I restored CONFIG.SYS from backup (yes, I *do* occasionally follow my own advice) and tried again. Same problem. I downloaded new drivers from SMC. Now the system would boot, but wouldn't load any of the network software, claiming that it couldn't find the server. The frame type was set correctly. The protocol was right. Nothing else was running.

To make a long torture short, the problem wasn't OS/2. It wasn't the NetWare drivers. It was the hardware—a faulty transceiver between the Ethernet adapter and the 10Base-T cable caused every packet to go out as a jabber (too long). How did I figure that out? First, I tried the same transceiver and cable on another workstation, and when that failed, I used a protocol analyzer to capture some packets.

It certainly took me a long time to figure out all this stuff, for such a simple product. JOHN MONTGOMERY

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NET TIPS

ARTISOFT LANTASTIC

Problem: *LANtastic prints to remote printers perfectly except under Windows: All those print jobs show up on the local printer.*

Solution: This usually means that you have Windows' "Fast printing directly to port" option turned on (this is the default). Select the Main icon group in Windows, run Control Panel, select Printers, Connect, and then uncheck the "Fast printing directly to port" checkbox.

VINCE WALDON
EDMONTON, ALBERTA, CANADA

Problem: *Even though the network is working, you sometimes get "Cannot attach to . . ." errors when you're logging in to a server or redirecting a device.*

Solution: LANtastic 4.0 and 4.1 will complain if you are already logged in to a server where the connection has been broken and you attempt to log in again, or if you are trying to use a device or drive that has already been redirected. Precede each NET USE or NET LOGIN command with the corresponding NET/NOERROR UNUSE or NET/NOERROR LOGOUT command; this clears the machine of previous attachments. The /NOERROR flag suppresses error messages that result if the NET UNUSE or NET LOGOUT command was not needed (if no previous connections exist). Here's an example:

```
NET/NOERROR LOGOUT \\Fred
NET/NOERROR UNUSE LPT1
NET LOGIN \\FRED
NET USE LPT1 \\FRED\@printer
```

VINCE WALDON
EDMONTON, ALBERTA, CANADA

Problem: *Some of my DOS applications don't print under LANtastic until I leave them and return to DOS.*

Solution: Some applications treat the printer like a file and don't flush the output until they close the file

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prior to exiting. This problem was common with applications written before networking was popular. To get around it, use LANtastic's Immediate Despooling feature. Run NET_MGR, then select Shared Resource Management. One of the menu options is Immed. Despool. Turn this option on. Then select a Despool Timeout value after which LANtastic will give up waiting for the printer to close and will flush the printer automatically. For most networks, 30 seconds is a good starting point; increase this number if your print jobs are being interspersed with other types of output.

VINCE WALDON
EDMONTON, ALBERTA, CANADA

Problem: *The NET PRINT command doesn't eject the last page of a job.*

Solution: You can tell LANtastic to add a form-feed to the end of every print job. Run NET_MGR, then select Shared Resources Management. Select the printer of interest, then enable the Form feeds option. This may add the occasional blank page to the end of other print jobs, but it will ensure that every NET PRINT job prints completely.

VINCE WALDON
EDMONTON, ALBERTA, CANADA

Problem: *Printing seems slow, especially for graphic images.*

Solution: There are several ways to speed up printing under LANtastic. Make sure LANtastic's Immediate Despooling feature is turned on. Run NET_MGR, then select Server Startup Parameters. Turn on the Immediate Despooling option. LANtastic will automatically select a timeout value of 30 seconds.

Another way to speed up printing, if you have the memory, is to redirect the spooler to a RAM drive. Create a RAM drive several megabytes in size (you can use RAMDRIVE.SYS which comes with DOS). Run NET_MGR, then select Queue Maintenance. Make the spool area your RAM drive by selecting the Change Spool Location option and filling in the Path of your new RAM drive. Be forewarned that LANtastic spools print jobs *and* e-mail to the same spool area, so if you reboot your server you'll lose any e-mail waiting to be read or any print jobs that haven't been printed yet.

Increasing the printer resources (buffers) will also speed things up (at the cost of RAM, of course). Run NET_MGR, then select Server Startup Parameters. Increase the Printer Buffer to 4,096 bytes (or more, if you can afford the RAM).

VINCE WALDON
EDMONTON, ALBERTA, CANADA

Problem: *You used QEMM to load your LANtastic drivers into upper memory, but now you get the occasional "Exception 13" error from QEMM.*

Solution: Chances are QEMM's OPTIMIZE program used QEMM's Stealth feature to pack everything high. With some motherboard/software combinations, this arrangement can be unstable. To check, look for a DEVICE=QEMM386.SYS ST:M line in your CONFIG.SYS file. Remove the ST:M option from the end of this line, then run through the Optimize process. But don't let QEMM turn on Stealth in an effort to load every last TSR high.

If your system is still unstable even without Stealth, try forcing LANtastic's SERVER.EXE program to be loaded low. To do this, edit the line in CONFIG.SYS or STARTNET.BAT and remove the LOADHI prefix to the line that loads SERVER.EXE. Look for a line that reads

```
C:\QEMM\LOADHI /R:2 SERVER
```

and edit it to read:

```
SERVER
```

This can clear up some forms of instability (at the expense of lower memory, of course).

VINCE WALDON
EDMONTON, ALBERTA, CANADA

WINDOWS FOR WORKGROUPS 3.11

Problem: *You're trying to share your CD-ROM drive, but no other machine can connect to it.*

Solution: If you're also running NetWare client software on the machine whose CD-ROM drive you want to share, the problem is probably that MSCDEX, the Microsoft CD-ROM Extensions for DOS, is loading before MSPIX, the Microsoft IPX-compatible protocol stack. Edit your AUTOEXEC.BAT and make sure MSIPX loads before MSCDEX.

DAN DOHAN
SAN JOSE, CALIFORNIA

Problem: *Although you have your DOS prompt set to PG to show the current directory, when you're on one of your network drives the path never changes.*

Solution: Check to make sure you haven't mapped two drives to this letter. Most likely, you'll find that you have a NetWare network and a Windows for Workgroups network volume mapped to the drive that's showing these problems.

DAN DOHAN
SAN JOSE, CALIFORNIA

HOT TIP NETWARE 3.1X

Problem: You've installed ODINSUP to run NDIS stacks on your ODI driver, but you're getting errors that say "Failed to bind."

Solution: There are two possible solutions to this problem. First, check the PROTOCOL.INI file in your Windows directory. It's possible that your Bindings= statements aren't all current. Next, check CONFIG.SYS and find the line that references the PROTMAN driver and make sure that the /I: parameter points to the directory in which PROTOCOL.INI resides. Finally, while you're in CONFIG.SYS, check to make sure that you removed your NDIS driver—ODINSUP replaces NDIS adapter drivers and the double-binding will cause a problem.

JOHN MONTGOMERY
SENIOR HELP EDITOR

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A FREE SYSTEM RESOURCES MONITOR

Learn Application Levitation from a Master

I sit with a dozen other novitiates in front of a small wooden platform in the main chanting hall of the monastery. The chanting begins on schedule, a low moan rising to ethereal heights. The elder chanter, I am told, can produce three notes from his throat simultaneously. Giant drums and thigh-bone flutes mix with the deep bass of 15-foot-long copper and brass horns. A small gust of wind catches the scent of burning juniper from great flaming incense cauldrons outside.

Chanters fall silent as a monk climbs onto the platform, skirts the curtains draped behind him, sits atop a small white pillow, and arranges his legs in the obligatory lotus position. The monk, wrapped in scarlet robes, sits in deep meditation. Ever so slowly, the monk drifts upward, levitating. Not far, mind you—a few inches at most. The novitiates sit transfixed. The chanters strike their lowest, most resonant notes. When suddenly . . . craaaaaack . . . the monk falls abruptly to the platform, as his hidden accomplices behind the drapes run for cover. Their sticks break.

This month we're going to take Samsara, the Visual Basic program we started last month, and put it through the levitation ringer so it's always on top. With a bit of luck, the stick won't break and our location behind the drapes will remain secure.

If you don't have last month's issue of *PC Computing* handy, you can catch up by starting Visual Basic 3.0 (we're using the Pro edition): Set the Border Style property of Form1 to 0, place a 3-D panel in the upper left corner of Form1, stick a Timer control on Form1, adjust its interval to 500, and click on File, New Form to create Form2. The code we'll be building this month is in "Samsara's Always on Top," (below).

When Last We Met Samsara, as we left it last month, talked to Windows in order to retrieve the free system resources (FSR) value. We took great pains to avoid mentioning it last month, but the GetFreeSystemResources() command you used so easily is a Windows application program interface (API) call. Yeah, one of those things that's supposed to be so hard to do the manual doesn't talk about it until the very last chapter.

Nearly all of the intelligence in last month's version of Samsara was built into the Timer1_Timer() event handler, the one that runs every half-second (thanks to our setting the Interval property to 500ms). No matter how you look at it, that's event-driven programming—a tick of the clock being a bona fide event—the other "hard" part of working with Visual

HOW TO DO IT — SAMSARA'S ALWAYS ON TOP

Here's the code to make Samsara stay on top of every window, so it's always visible. Form1's Timer1_Timer() code is shown in "Floats Like a Butterfly," page 258. First, go to Form1, Object (general), Proc (declarations), and type in this line:

```
Declare Function GetFreeSystemResources Lib "User" ⊃
⊂(ByVal fuSysResource As Integer) As Integer
```

Next, go to Form1, Object: Form, Proc: Load and add the following lines of code:

```
Sub Form_Load ()
Rem Shrink form down to the size of the 3D Panel
Form1.Width = Panel3d1.Width
Form1.Height = Panel3d1.Height
Rem Move the 3D Panel to the lower right corner
Form1.Top = Screen.Height - Form1.Height
Form1.Left = Screen.Width - Form1.Width
Rem Set 3D Panel's flood color to green
Panel3d1.FloodColor = RGB(0, 255, 0)
Rem Start by "clicking" the Always On Top check
Rem box, then the OK button on Form2.
Form2.Check1.Value = 1 'Change to 0 for not on top
Form2.Command1.Value = True
End Sub
```

Next, in Form1 Object: Panel3D1, Proc: Click, add:

```
Sub Panel3D1_Click ()
Form2.Show
End Sub
```

Then, with Form2, Object: (general), Proc: (declarations), type:

```
Rem Tell VB where to find the SetWindowPos function.
Declare Sub SetWindowPos Lib "User" (ByVal hWnd As⊃
⊂Integer, ByVal hWndInsertAfter As Integer, ByVal X As⊃
⊂Integer, ByVal Y As Integer, ByVal cx As Integer, ByVal⊃
⊂cy As Integer, ByVal wFlags As Integer)
```

And finally, in Form2 Object: Command1, Proc: Click, type:

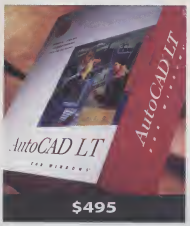
```
Sub Command1_Click ()
If Check1.Value = 1 Then
Call SetWindowPos(Form1.hWnd, -1, 0, 0, 0, 0, 27)
Else
Call SetWindowPos(Form1.hWnd, -2, 0, 0, 0, 0, 27)
End If
Form2.Hide
End Sub
```



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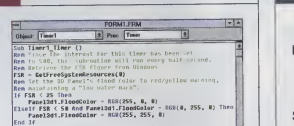
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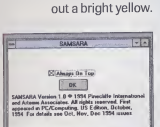
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WORKAROUNDS

FLOATS LIKE A **BUTTERFLY**

Yellow Streak: The code that implements Samsara's FSR "low water mark" is between the If and End If statements. RGB(255, 0, 0) returns a fire engine red, and RGB(255, 255, 0) comes out a bright yellow.





Samsara at Work: It isn't always easy to stay above the crowd. Click on this box to turn on the Always On Top feature, and Samsara's resource gauge will stay on top. It's the yellow FSR bar in the lower right corner of the desktop (at left). It's yellow because FSR has dropped below 50 percent.

Basic in particular and Windows in general.

So now that you've conquered Windows API calls and event-driven programming, there's not much left but implementation details, eh? Good. No need for you to get nervous.

One of Samsara's neatest capabilities is almost subliminal, a visual clue as to where your free system resources have been. We tend to think of it as an FSR "low water mark." As long as your FSR stays above 50 percent, the Samsara bar remains green. But when the FSR dips below 50 percent, the bar turns yellow, and it *stays* yellow. That's a quick visual reminder that you've taxed the system at some point, and you should consider restarting Windows when it's convenient. If the FSR goes below 25 percent, the bar turns red, and it stays red.

Glance down at the lower right corner of your screen, and if Samsara is glowing red, you know it's time to put Windows out of its misery. Shut it down, and give it another ride on the karmic wheel. Samsara, for all of this sleight of hand, runs seven lines and goes in the Timer1_Timer() event handler, replacing last month's assignment of a green FloodColor for the 3-D panel (see the top screen in "Floats Like a Butterfly," above).

Suspended in Mid-Air Now let's give Samsara its levitation (a little levity being a good thing). Flip over to Form2, the one with SAMSARA for a title. Click on the check box icon—it's the one that looks like a square with an *x* in the middle. Draw a check box about a third of the way down Form2, then type Always On Top. This box controls whether Samsara always floats on top of every window. The key is another Windows API call, SetWindowPos(), which tells Windows to keep a window on top (with a value of -1) or let it float (with a value of -2).

Click on the oval-shaped push-button icon in the Toolbox, then put a push button below the check box, and type OK. You now have an OK button called Command1 (see "Samara's Always on Top," page 256). The verbiage below the OK button is in a single Label control.

Double-click on the OK button, and Visual Basic puts you in the Command1_Click() event. Enter the code you see in "Samara's Always on Top," and continue with the Declare SetWindowPos line for the (general)/(declarations) section.

Finish off with the code for positioning the FSR bar in the lower right corner of the screen, as shown in Form1's Form_Load section of the code listing. Form_Load runs whenever Form1 gets loaded, that is, whenever you run Samsara.

WOODY LEONHARD & VINCENT CHEN

Next month we'll teach Samsara how to restart Windows. Pick up a copy of the final, functioning program—and all the source code—on PC Contact's data library 3 (Utilities/Misc.). See page 262 for instructions. You can reach WOODY *at 72241,2125, or* VINCE *at 72241,2221.*

TOOL TIPS

MICROSOFT VISUAL BASIC 3.0

Problem: *While performing the compress phase of Setup Wizard, you encounter the error "OLE2UI.DLL Not Found."*

Solution: The file OLE2UI.DLL does not exist and was included in SETUPWIZ.INI in error. Use your favorite text editor and remove all references to OLE2UI.DLL in the SETUPWIZ.INI file. Also, it's a good idea to check and make sure that you don't have multiple copies of the INI file lying around.

WAYNE R. HENDLER
ORLANDO, FLORIDA

Problem: *While performing the compress phase of Setup Wizard, you encounter the error "Sharing Violation."*

Solution: The easiest way to get around this problem is to modify the attributes of your DLLs and VBXs to read-only. For example:

```
CD\WINDOWS\SYSTEM
ATTRIB *.DLL +R
ATTRIB *.VBX +R
```

WAYNE R. HENDLER
ORLANDO, FLORIDA

Problem: *You want to use the Enter key instead of the Tab key to move from field to field.*

Solution: It's relatively easy to fool Visual Basic for any control that has a KeyPress event. In the event, place the following code:

```
Sub MyText_KeyPress (KeyAscii
As Integer)
If KeyAscii = 13 Then
KeyAscii = 0
SendKeys "{TAB}"
End If
End Sub
```

This code checks to see if the Enter key was pressed. If so, it resets the key to null and sends a Tab to the control.

A word of caution: If your form has a command button with the Default property set to true, then the code above will not work correctly. The button will intercept the Enter key and

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Circle 157 on reader service card.

perform the button's Click event instead of reaching the control's KeyPress event.

Wayne R. Hendler
Orlando, Florida

ANY C++ COMPILER

Problem: *You want to know when you can use implicit default constructors.*

Solution: The simple answer is never. A good defensive programming technique when defining a new class is to always declare a default constructor function, even if you don't add any statements to this function. A default constructor is one that has no arguments (except possibly for default arguments).

This is good programming practice because C++ supplies an implicit default constructor for you, unless you write another constructor function. Consequently, if you write code that implicitly relies on the default constructor (for example, in uninitialized declarations of the class and arrays of the class), and then you innocently add some other constructor function later, the implicit default constructor seems to disappear and your code suddenly cannot compile.

Also, remember that any type declared with the class, struct, or union keyword is actually a class. Paradoxically, then, the class keyword is only one of the keywords that can be used to define a class. In C++, all classes, including those defined with struct or union, can contain both data members and member functions. By convention, the class keyword is most frequently used to define a class that contains member functions, but remember that struct or union can be used for this purpose as well. The struct keyword has the same meaning as class, except that for struct, access is public by default rather than private.

The general guideline is that if you know for certain that a class is to have data members only (for example, if it's to be used like a structure in C), you don't need to define a constructor function. Otherwise, you should explicitly declare a default constructor, even if you add no statements to it.

Microsoft
Technical Support

ASSEMBLY LANGUAGE

Problem: *You want a good way to interpret command-line parameters, even if the user types more than one space between them.*

Solution: A common mistake that beginning assembly language programmers make when writing code to parse the command line is to assume that the text of command-line parameters begins at offset 82h in the Program Segment Prefix (PSP). If the user types only one space between the command and the first command-line parameter, this assumption holds true. But a well-written program shouldn't choke if the user inadvertently types two spaces, or chooses to use tab characters instead of spaces.

The following assembly language procedure illustrates a simple technique for finding parameters entered on the command line:

```
FindChar proc near
cld
FC1: lodsb
cmp al,20h
je FC1
cmp al,09h
je FC1
cmp     al,0Dh
je FC2
dec si
clc
ret
FC2: stc
ret
FindChar endp
```

On entry, DS:SI should point to the first character following the command itself, which is always located at offset 81h in the PSP. On exit, DS:SI points to the first character in the first command-line parameter. If there are no command-line parameters—if the command line is empty—the FindChar returns with the carry flag set. If a command-line parameter is found, carry returns clear. With this procedure to call upon, you can point SI to the first command-line parameter with the simple instructions

```
mov si,81h
call FindChar
```

This example assumes that DS already points to the PSP segment, as it does on entry to any COM or EXE file. FindChar will find a command-line parameter no matter how many spaces or tabs separate it from the command itself. It can also be used to move from one command-line parameter to another if called with DS:SI pointing to the first character following the previous parameter.

Jeff Prosise
Contributing Editor

BORLAND C++

Problem: *You have a growing number of BWCC.DLL files on your hard disk and want to delete them.*

Solution: You should be able to delete all of them except for the one in \WINDOWS\SYSTEM. Make sure it's the most recent one. If you find a newer one somewhere else, move it to \WINDOWS\SYSTEM.

John Montgomery
Senior Help Editor

Problem: *You want to know which DLLs your application uses.*

Solution: Run TDump on the executable. The output should have a Module Reference List that lists any DLL your application links to. Note that if you're using the LoadLibrary function, this method won't work.

John Montgomery
Senior Help Editor

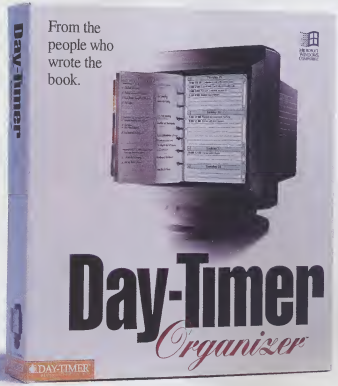
HOT TIP VISUAL C++ 1.0

Problem: You want to disable certain menu items by graying them out.

Solution: Use the Microsoft Foundation Classes (MFC). For every menu item you want to enable or disable, you should write an ON_UPDATE_COMMAND_UI handler. The ClassWizard will easily insert the body for you. If you get a parameter pCmdUI in your function, call pCmdUI->Enable(TRUE/FALSE) accordingly.

THOMAS ZEISLUFT
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Circle 178 on reader service card.

This Month's Free Software and Shareware

All the public-domain and shareware programs and utilities featured in *PC Computing* each month are available on our online service, PC Contact, or on disk from Public Brand Software for a fee. Shareware requires additional payment to authors for continued use. This month's files are available in PC Contact's data library 3 (Utilities/Misc.). For information on ordering them from Public Brand Software, see below. Here's a sampling of the programs you'll find this month.

WINDOWS: CLASSY TEXT EDITOR 228

Quick Notes If you need a better Notepad than Notepad, try Quick Notes. It has many features you'd expect to find in a full-blown word processor, like font support, word wrap, word count, case conversion, and more. Download QUIKNO.ZIP.

DOS: QUICK CALCULATOR 234

Command Line Arithmetic C—not the programming language, but a quick command-line calculator—can perform simple mathematical problems (addition, subtraction, multiplication, and division) right at your DOS prompt. Download C.ZIP, or mail $5 directly to the author: Tom Wilson, 3172 18th St. NW, Washington, DC 20010.

NETWORKING: GET IN THE QUEUE 252

QManager Pro Printing problems top everybody's list of aggravations with NetWare, but this utility will make your life as system administrator a little easier. A much better solution than PCONSOLE, QManager Pro lets you start and stop queues, remove print jobs, and even rename a queue. Download QMPRO.ZIP.

TOP PICKS ON DISK

You can easily get all the public-domain utilities or shareware covered in this month's issue by calling Public Brand Software at (800) 426-3475 or (317) 856-7571. Ask for this month's Editor's Picks from *PC Computing*. They're available for $5 or less per disk (most disks have several utilities and programs on them), plus $5 for shipping and handling.

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Current CompuServe or ZiffNet members type GO ZNT:PCCONTAC at any CIS ! prompt. Cost varies depending on which CompuServe plan you belong to and the speed at which you connect. For complete membership and hourly rate information, type GO RATES while online.

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3. Dial the access number with a modem. When your modem connects to the network, press Ctrl-C to get the system's attention.
4. At the HOST NAME prompt, type CIS and press Enter.
5. At the USER ID prompt, type 177000,5300 and press Enter.
6. At the PASSWORD prompt, type PC/CONTACT and press Enter.
7. At the ENTER AGREEMENT NUMBER prompt, type PCC94 and press Enter.

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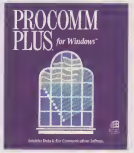
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How It Works

BY RON WHITE
ILLUSTRATED BY
TIMOTHY EDWARD DOWNS

Object Linking and Embedding 2.0

Have you ever wanted an application with the formatting capabilities of a word processor, the data-juggling muscle of a database, the math acumen of a spreadsheet, and the panache of a presentation graphics program? Maybe you can't buy such a multifunction application, but you can create your own with OLE 2.0.



1 When you create an **OLE 2.0** link between two applications, called the **client** and the **server,** Windows treats the data as an **object** and pastes it into the client application. A link marker identifies the application that originally created the data.

2 After you've embedded an object from one application into another, you double-click to edit it. The client application checks the link marker to figure out what application created the data.

Share Features across Applications with a Little Help from OLE 2.0



3 The server then calls on an OLE **dynamic link library** (DLL), requesting the functions associated with the server application. The DLL, in turn, passes the request to the server, which activates **USER.EXE,** the module responsible for handling Windows menus.



4 USER.EXE replaces menus in the client application with menus from the server. The only client menus that remain are those that are generic to most Windows applications, such as File and Edit. Using the substitute menus, you can modify the embedded data just as if you were running the server application itself. Clicking outside the embedded object restores the client's original menus and updates the data file.

KEY WORDS

OLE 2.0: One of the ways in which OLE 2.0 differs from OLE 1.0 is that Version 2.0 lets you embed objects within other embedded objects (creating something called a storage object). A data file created using this system of multilevel embedding is called a compound document.

Client: Programs that contain embedded objects from other OLE-aware programs are called client applications.

Server: When you double-click on an embedded object in a client application, you launch the originating program, called the server application.

Object: Any distinct, separate entity—a program, device, or self-contained chunk of data—is called an object. In OLE, an object can be any group of data selected by the user, such as a block of text or spreadsheet cells, a sound, a chart, or an illustration. These objects can be embedded into documents created by other applications.

Dynamic Link Library: Windows files with the extension DLL contain discrete sections of code and data that can be used by Windows, various applications, and other DLLs to perform a specific task. The same DLL loaded into memory can be used by two or more applications running at the same time.

USER.EXE: One of the main code modules in Windows, USER.EXE is in charge of displaying menus, scroll bars, buttons—all the elements of the Windows interface that typically surround the data being worked on by an application. Another module, GDI.EXE, is responsible for displaying the data itself.

Help F1: Robert L. Hummel Dissects Math Coprocessors

SOLUTION FOR SOME SLOW SYSTEMS

Vitamin C, Aspirin, and a Math Coprocessor

You take your vitamins, right? But do you know what they do? We have a vague notion that they're helpful (or at least not harmful), but if asked exactly what B12 does, we'd probably shrug and mumble something about digestion. Think about that when you ask a PC dealer what a coprocessor does. If you're lucky, you'll get, "Speeds floating-point calculations." Oh boy. That's a big help. Thanks a lot.

In its simplest terms, the math coprocessor (or floating-point unit, or numeric coprocessor, or whatever name is in vogue this week) frees your CPU from many calculations done frequently in spreadsheets and graphics packages. If you frequently use such applications, a math coprocessor can increase your system's performance noticeably. Bottom line: If you have a system built on the 80386 (or earlier) without one, a math coprocessor is a simple, inexpensive way to improve performance.

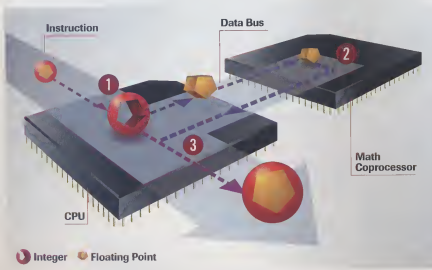
Let's clear up some of the uncertainty that shrouds the world of the coprocessor. First, a quick explanation of how integer CPUs handle different types of numbers. Next, we'll look at what a coprocessor actually does and when it's necessary or desirable to have one. Finally, you'll learn what type of coprocessor is appropriate for your computer.

The 80x86 family of CPUs comprises complex instruction set chips (CISCs). This simply means that each instruction performs a complete operation, such as multiplying two numbers. But the CPU is fundamentally an *integer* processor, designed to deal exclusively with integer data. Ask your CPU to divide 7 by 2 and it returns the answer as 3 because integers don't accommodate fractions.

Point Taken None of Intel's CPUs, from the 8088 to the Pentium, support instructions that operate directly on what are called *real* or *floating-point* numbers. (Keep your pens holstered: The 80486DX and Pentium do contain a floating-point unit in the same package, but it is *separate* from the integer CPU.) Nonetheless, these processors are versatile and powerful. Any floating-point operation can be broken down so that each individual step involves only integer math. Thus, the integer-only

HOW IT WORKS TWO PROCESSORS WORK IN PARALLEL TO BOOST PERFORMANCE

Load Lightener: A math coprocessor offloads some work from the main CPU. The CPU and math coprocessor operate as two separate units—even when included in the same package, as in the 80486 and Pentium. Here's how the 80386 CPU and 80387 coprocessor cooperate.



1. Separate: When the 80386 detects a complex instruction, it separates the floating point from the integer component and transfers the floating-point instruction and its operands to the 80387.

2. Execute: While the 80387 executes the floating-point instruction, the 80386 continues to process the integer instruction as long as that doesn't depend on the floating-point results.

3. Reunite: After the 80387 has finished processing successfully, it sends the floating-point instruction back to the 80386, where its results are combined with the integer results. If an error occurs, the 80387 interrupts the 80386.



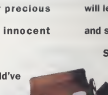
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CPU can be programmed to divide 7 by 2 and get 3.5 as the answer.

Although it's common to use an integer CPU to perform floating-point math, you won't get something for nothing. Because emulating a single floating-point operation requires many integer instructions, performance is slower than when performing integer operations. Some software does only an occasional floating-point calculation—a word processor calculating tab stops, for example. In that case, you won't notice the delay. But for math-intensive software, such as a spreadsheet, drafting program, or graphics manipulation program, the slowdown can be significant.

Two Brains The engineers at Intel recognized that adding a dedicated floating-point processor to a system would be a natural upgrade for many users. To that end, they designed a mechanism into the 80x86 family that allowed the CPU to share processing responsibility with other specialized coprocessors. One such unit is the math coprocessor, optimized to perform floating-point math and little else.

Like the main processor, the math coprocessor is a vast array of microcircuits designed to implement complex functions. The processor and coprocessor complement each other and can work in tandem.

The processor fetches and decodes instructions and calculates addresses of memory operands. The coprocessor works in parallel to siphon off specially coded floating-point instructions. Since it doesn't have to fetch or decode instructions or calculate memory addresses, the coprocessor, despite its optimized performance, is a simpler device architecturally.

Because the processor and coprocessor are both physically and programmatically separate microprocessors, the coprocessor is able to operate asynchronously from the main processor, often using an entirely different clock speed. When the processor gets an instruction intended for the coprocessor, it retrieves any needed operands, allows the coprocessor to grab the floating-point instruction, then immediately proceeds to decode and execute the next instruction.

Unless the next instruction is either another coprocessor instruction or depends on the result of the previous coprocessor instruction, both processors function at the same time. Because floating-point operations may take several hundred clock cycles to complete, the careful assembly coding that allows parallel operation often improves application performance.

What kind of improvement can you expect? Compared with the time required to multiply two floating-point numbers using integer emulation, a coprocessor will be up to 200 times faster. Your mileage will vary because this improvement applies only to the time spent doing the math. Other portions of your application, including screen display, disk activity, and the time spent waiting for you to type a key, don't benefit at all.

The Big Question I've explained what a coprocessor is, but do you need one? Well, first you need to find out if you already have one in your computer.

Coprocessors come in two types: external and internal. For systems based on the 80386 and earlier processors, the coprocessor is a separate chip that can be added to your system. Check your BIOS display when your system boots; it should tell you whether there's a math coprocessor present.

FYI PROCESSOR **COMBOS**

Processor	Coprocessor
8086, 8088	8087
80286	80287, 80287XL
80386SX	80387SX
80386DX	80387DX
80486SX	80487SX
80486DX	Built-in FPU
Pentium	Built-in FPU

Mix and Match: Each processor in the 80x86 family has a corresponding coprocessor with which it's compatible. The coprocessor must be at least as fast as the processor (it can be faster, too). Thus, you can install a 33MHz coprocessor in a 25MHz system without a problem.

On the 80486DX and Pentium processors, the coprocessor is built in and is called simply the floating-point unit (FPU). The 80486SX, on the other hand, is essentially an 80486DX with the floating-point unit disconnected. The 80487SX, billed as a coprocessor, is actually a fully functional 80486DX. When you install it, it turns off the 80486SX chip and assumes the responsibility for providing both floating-point and integer functions.

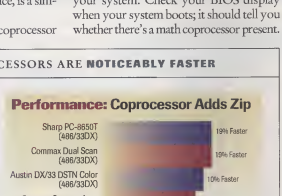
So if you have an 80386 (or earlier) or an 80486SX, you need to answer one question: Is most of the work you do floating-point intensive (spreadsheets and graphics, for example)? If the answer is yes, a math coprocessor could be a perfect, inexpensive solution to your problem—it's around $80 to upgrade an 80386.

Maybe it's not such a bad idea to treat a math coprocessor like a vitamin—it probably won't hurt and it may help.

ROBERT L. HUMMEL *is a contributing editor to* PC Computing *and author of* Programmer's Technical Reference: Data and Fax Communications *(Ziff-Davis Press, 1991). You can reach him c/o Help,* PC Computing, *950 Tower Lane, 19th Floor, Foster City, CA 94404.*

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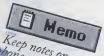
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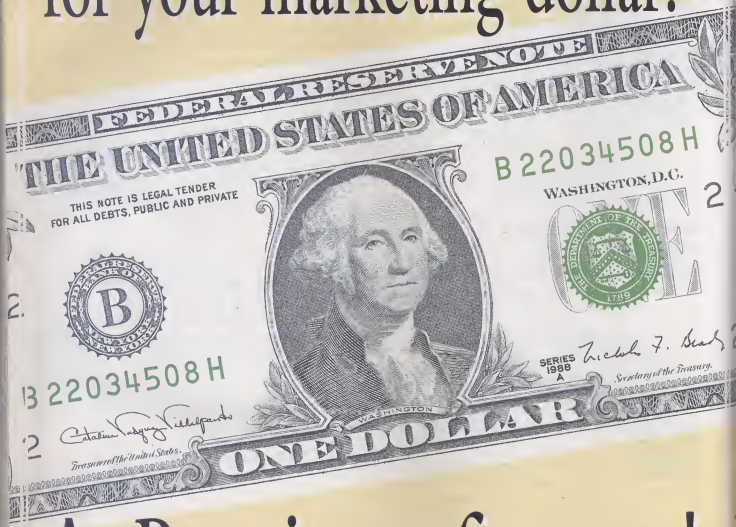
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You'll need at least a 16-bit sound card with a 44.1kHz maximum sampling rate and wave-table synthesis. Also, 4-watt-per-channel output or higher ensures that folks in the back row will hear your presentation. Ultimately, there's no better judge of audio and video quality than your ears and eyes, so try before you buy if you can.

Double- and triple-speed CD-ROM drives with 200ms or faster access times are now the standard. Settle for nothing less. Also, make sure that your CD-ROM drive comes with a 64K cache: You don't want animation and video sequences to stutter on your screen. Incidentally, your drive should provide multisession Kodak Photo CD support since audio and motion video aren't the only applications it will run.

As compatibility goes, MPC-2 is a given, but double-check before you buy. The audio card should be compatible with Creative Labs' Sound Blaster and the Microsoft Windows Sound System. The CD-ROM drive should have a SCSI-2 interface. Avoid proprietary SCSI-like interfaces—this will make it easier to run your CD-ROM drive on a standard SCSI host adapter. Look for MIDI, microphone, speaker, and joystick ports. Incidentally, RCA-type external audio ports let you hook up ordinary stereo speakers without fussy adapters.

To take advantage of full-motion video (30 frames per second), you may have to upgrade your video card to one that supports MPEG decompression. It is quickly becoming the industry standard, and dozens of video card makers now build it in at no extra cost—especially on 24-bit accelerators. Given its true-color resolution, an upgrade is worth the cost. MARTY JEROME

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Red Flags: Speaker quality varies. Test it with audio CDs. For full-motion video, you may need a video card that supports MPEG decompression.

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USA Flex	275	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
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PC Zone	294-5	Mon - Sun 5am-11pm,	800-252-0386
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Insight	306-7	24 Hours	800-927-3159

NETWORK SERVERS



CPU: Intel 486DX2/66, 486DX4, or Pentium.

RAM: 16MB, expandable to 128MB.

CPU RAM Cache: 256K.

Display: 14-inch Super VGA color or monochrome.

Video Card: Super VGA with 512K of RAM.

Hard Drive: 1GB SCSI-2.

Bus: Eight EISA slots with two VL-Bus or PCI.

Drive Bays: Two full-height 5¼-inch, two half-height 5¼-inch with front-panel access, two 3½-inch.

Features and Options: RAID-5, DAT backup, uninterruptible power supply, dual-speed CD-ROM drive, built-in SCSI-2 controller, Ethernet controller, protected power switch to prevent accidentally turning the power off.

Other Requirements: FCC Class A or better, UL listed.

RED FLAGS: Systems with ISA bus or slotted RAM are less upgradable. Database and other application servers need more CPU power than a file server.

MIDRANGE DESKTOP SYSTEMS



CPU: Intel 486DX2/66, 486DX4, or Pentium.

Secondary Cache: 256K four-way set-associative.

Memory: 8MB, expandable to 32MB, 72-pin SIMMs.

Floppy Drive: 3½-inch.

Hard Drive: 400MB or larger IDE or SCSI-2.

Video: VL-Bus or PCI Windows accelerator, 15-inch monitor or larger with 72Hz refresh at 1,024 by 768 pixels.

Slots: Eight ISA slots for full-sized case (including two VL-Bus or PCI), three ISA slots for small-footprint case with integrated VL-Bus or PCI video and drive controller.

Drives and Bays: One 3½-inch 1.44MB and one 5¼-inch 1.2MB floppy drive, five half-height 5¼-inch bays.

Features and Options: Dual-speed or faster CD-ROM drive, sound card or built-in sound capability, two parallel ports, two COM ports, and keyboard and mouse ports.

RED FLAGS: Watch for Pentium-upgradable systems that don't include a ZIF socket, secondary CPU cache, or lots of slots for extra RAM.

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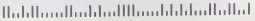
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NETWORK **SERVERS**



CPU: Intel 486DX2/66, 486DX4, or Pentium.

RAM: 16MB, expandable to 128MB.

CPU RAM Cache: 256K.

Display: 14-inch Super VGA color or monochrome.

Video Card: Super VGA with 512K of RAM.

Hard Drive: 1GB SCSI-2.

Bus: Eight EISA slots with two VL-Bus or PCI.

Drive Bays: Two full-height 5¼-inch, two half-height 5¼-inch with front-panel access, two 3½-inch.

Features and Options: RAID-5, DAT backup, uninterruptible power supply, dual-speed CD-ROM drive, built-in SCSI-2 controller, Ethernet controller, protected power switch to prevent accidentally turning the power off.

Other Requirements: FCC Class A or better, UL listed.

RED FLAGS: Systems with ISA bus or slotted RAM are less upgradable. Database and other application servers need more CPU power than a file server.

MIDRANGE **DESKTOP** SYSTEMS



CPU: Intel 486DX2/66, 486DX4, or Pentium.

Secondary Cache: 256K four-way set-associative.

Memory: 8MB, expandable to 32MB, 72-pin SIMMs.

Floppy Drive: 3½-inch.

Hard Drive: 400MB or larger IDE or SCSI-2.

Video: VL-Bus or PCI Windows accelerator, 15-inch monitor or larger with 72Hz refresh at 1,024 by 768 pixels.

Slots: Eight ISA slots for full-sized case (including two VL-Bus or PCI), three ISA slots for small-footprint case with integrated VL-Bus or PCI video and drive controller.

Drives and Bays: One 3½-inch 1.44MB and one 5¼-inch 1.2MB floppy drive, five half-height 5¼-inch bays.

Features and Options: Dual-speed or faster CD-ROM drive, sound card or built-in sound capability, two parallel ports, two COM ports, and keyboard and mouse ports.

RED FLAGS: Watch for Pentium-upgradable systems that don't include a ZIF socket, secondary CPU cache, or lots of slots for extra RAM.

SUBNOTEBOOK PCS



CPU: Intel 33MHz 486SX .

Display Type: 7½-inch backlit passive, dual-scan passive, or active-matrix LCD.

Weight: 4 pounds or less without AC adapter.

Size: Smaller than 8½ by 11 by 2 inches.

Keyboard: 85 percent of full-sized keyboard.

RAM: 4MB, expandable to 16MB.

Hard Drive: 80MB or larger.

Features and Options: Removable hard drive, high-speed internal fax modem, integrated pointing device, infrared keyboard connection.

Other Requirements: External floppy, at least one PCMCIA Type II slot, small recharger (5½ by 3 by 1¼ inches or smaller).

RED FLAGS: Subnotebook displays and keyboards entail compromise—try before you buy, or make sure there's a money-back guarantee with no restocking charge. In addition, many subnotebook batteries run down quickly, particularly when you're using color. Make sure the battery is easy to replace. User-installable RAM is also a plus.

NOTEBOOK PCS



CPU: 33MHz 486.

Display Type: 9½-inch or larger backlit dual-scan passive- or active-matrix color LCD with accelerated local bus. Look for adjustable contrast and brightness controls.

Weight: Less than 7 pounds without AC adapter; total traveling weight less than 9 pounds.

Size: Smaller than 10 by 12 by 2 inches.

RAM: 8MB, expandable to 20MB.

Hard Drive: 120MB.

Ports/Slots: Parallel, 9-pin serial, PS/2 ports; one PCMCIA Type III slot or two Type II slots.

Features and Options: Ability to swap out floppy drive for second battery, removable hard drive, user-installable RAM, integrated pointing device. Pen pointing device and touch screen can be useful in some instances. Look for notebooks that support new Duracell standard-sized rechargeable batteries.

Other Requirements: Standby mode, pop-up battery gauge, 6-by-3-by-3-inch (or smaller) battery recharger.

WINDOWS DISPLAYS



Size: 17 inches, 20 to 21 inches for graphics applications.

Resolutions: 1,024 by 768; 1,280 by 1,024 for 20- and 21-inch monitors; some support 1,600 by 1,280, noninterlaced.

Dot Pitch: 0.28mm or smaller for 17-inch monitors, 0.31mm or smaller for 21 inch.

Vertical Refresh Rate: 72Hz or higher at all resolutions.

Tube type: Flat-square or Trinitron.

Controls: Front-panel or onscreen digital controls.

Features and Options: Support for MPR II low-emissions standards, compliance with EPA Energy Star requirements, ability to save settings for different resolutions and refresh rates. For 21-inch monitors, use 1,600-by-1,200 resolution.

Other Requirements: Adjustable tilt-and-swivel base, video cable, antiglare coating or add-on filter, color controls, microprocessor-based controls.

RED FLAGS: Monitors with dot pitch above 0.31mm may seem fuzzy. Make sure the monitor supports the resolutions and particularly the refresh rates of your video card.

SOUND CARDS



Compatibility: Sound Blaster.

Mode: Stereo.

Card Type: Internal.

Sampling Capability: 8- and 16-bit record and play (MPC-2 standard).

Maximum Sampling Rate: 44.1kHz.

Synthesizer: Wave or FM with Wave option.

Voices: 16 simultaneous in Sound Blaster mode, 24 in Roland.

Bundled Software: Windows and DOS utilities for playing, recording, and editing digital and MIDI files.

Ports: Speaker, microphone, and joystick.

Features and Options: Programmable digital signal processor (DSP), SCSI port for a CD-ROM drive, QSound Virtual Audio, microphone, powered speakers, bundled software that supports OLE 2 so you can easily embed sounds in documents.

RED FLAGS: Cards that play but can't record 16-bit sound or have a proprietary (non-SCSI) CD-ROM interface may be less useful.

WINDOWS ACCELERATOR CARDS



Resolutions: 1,024 by 768 pixels; 1,280 by 1,024 for 20- and 21-inch monitors.

Colors: 256 colors at 1,024-by-768 resolution for business apps; 65,000 colors (or more) at 1,024 by 768 for near–photo-quality images.

Accelerator Chip: Fixed-function chip such as S3 Vision 964, IIT AGX014, or ATI 88800 (Mach 64).

Vertical Refresh Rates: 72Hz or higher at all resolutions.

RAM: 1MB for 256 colors at 1,024 by 768; 2MB or more for higher resolutions and more colors. Choose VRAM over DRAM for more than 256 colors and high (72Hz) refresh rates.

Features and Options: VL-Bus or PCI model option, Windows utility that can switch resolutions and colors.

Other Requirements: Driver installation software; two-year warranty; Windows 3.1 drivers; free driver updates via BBS, CompuServe, or mail.

RED FLAGS: Interlaced boards and boards with 70Hz (or lower) vertical refresh rates produce more flicker.

24-BIT VIDEO CARDS



Graphics Processor: For 24-bit Windows applications, a fixed-function processor; for 24-bit DOS apps, a full-fledged graphics coprocessor like the TI34020 chip.

RAM: 4MB of VRAM (not DRAM).

VGA Support: Onboard VGA chip.

Resolutions: 1,024 by 768 or higher.

Colors: 16.7 million colors at 1,024-by-768 or 1,152-by-870 resolution.

Vertical Refresh Rates: 72Hz at all resolutions.

Drivers: For Windows 3.1 and your specific DOS applications.

Features and Options: VL-Bus, PCI, or EISA models; Windows utility to switch resolutions and colors.

Other Requirements: Two-year warranty; free driver updates via CompuServe, BBS, or mail.

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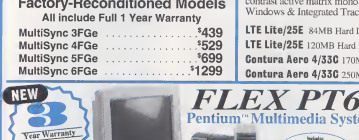
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Processor: 16MHz RISC.

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RAM: 8MB.

Interfaces: Parallel and 10Base-T or 10Base2 Ethernet, Token Ring, or LocalTalk.

Network Support: Concurrent for Novell NetWare, Windows NT, and Windows for Workgroups.

Paper Capacity: 1,000 sheets.

Warranty: One year with onsite service.

Features and Options: SNMP support, particularly the ability to download printer drivers to all network printer users from a central node; EPA Energy Star compliance; legal-sized paper tray; LCD front-panel display.

COLOR INK JET PRINTERS



Speed: Six pages per minute for black-and-white documents; 1 to 2 minutes per page for color.

Resolution: 300-by-600 dpi for "quality" mode, but look for a draft mode as well.

Cartridges: In addition to the standard cyan, magenta, and yellow cartridges, black has its own larger cartridge. Each cartridge has 104 nozzles.

RAM: 4MB for personal use; 8MB or more for network use.

Interface: Network option in addition to high-speed parallel interface with auto-switching between the two.

Fonts and Printer Language: At least 25 internal fonts, 10 TrueType; PCL 5 built-in with PostScript Level 2 option.

Other Features: Fast-drying ink is now available, as are heated paper paths, which make slow-drying ink solid in an instant.

DESKTOP LASER PRINTERS



Print Speed: 4 to 6 ppm, with optional draft mode for faster printing.

Duty Cycle: 10,000 pages per month or higher.

Memory: 2MB, expandable to 4MB or more.

Resolution: 300 or 600dpi.

Languages: PCL 5, and TrueType or PostScript Level 2 with autosensing capability for switching between emulations.

Paper Handling: Ability to print on index cards, heavy stock, envelopes, transparencies.

Paper Capacity: At least 150 sheets (with optional 250-sheet tray or larger).

Fonts: 14 internal bit-mapped fonts and 8 TrueType or Postscript internal scalable fonts. Also, HP-compatible cartridge slot for adding ROM-based fonts.

Features and Options: Look for Energy Star label to save on electric bills; printers that use "microfine" toner typically produce sharper images.

Red Flags: Apply 3-cents-per-page cost of consumables for comparison shopping. Also, make sure toner cartridges are available from third-party manufacturers.

COLOR THERMAL WAX-TRANSFER PRINTERS



Processor: Look for a 16MHz RISC CPU at least.

RAM: 4MB, upgradable to 8MB.

Interface: A parallel port is usually sufficient.

Fonts: 35 Adobe PostScript Type 1 at the minimum.

Ribbon: A four-color ribbon will give you blacker blacks.

Emulations: PostScript Level 1 and 2, and PCL 5.

Print Speed: 2 ppm.

Resolution: 300-by-600 dpi.

Features and Options: Internal network interfaces, support for four-color ribbons (three colors plus black), EPA Energy Star compliance, ability to print on B-oversize paper.

RED FLAGS: Be sure vendor provides a PostScript Level 2 driver. Despite some claims, business-quality printing on plain copier paper isn't a reality yet, although many printers can manage low-weight, uncoated paper.

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"PC Computing's CPMs were very attractive but we wanted more. We looked at the quality of the publication, paid vs. free subscriptions, plus renewal levels, since all point to strong reader involvement. We looked at circulation growth, which boosts the odds of getting bonus circulation. We also like where PC Computing is targeted, and it's a monthly so we think you can get a much higher percentage of passalong readers.

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PC Computing

SCSI HOST ADAPTERS



Industry Compatibility: Fast SCSI-2 with Advanced SCSI Programming Interface (ASPI).

Bus: EISA or MCA host card if your system supports it, plus VL-Bus or PCI local bus.

Performance: 10MB per second sustained transfer rate; works with Windows SmartDrive Double Buffering for maximum performance.

Drivers: DOS, Windows, OS/2, and NetWare, plus drivers for any other OS you plan to run.

Minimum Device Size: 8GB or more.

Installation: IRQ, DMA, port addresses, and BIOS can be set through software; termination is set through software or a single jumper; installation program and diagnostic utilities included.

Features and Options: Floppy controller built in; sound chip (Sound Blaster compatible) or Ethernet chip included; 50-pin D-shell connector for attaching external device; dual-channel support for attaching up to 14 devices; RAID levels 0,1,5 option.

HARD DRIVES



Performance: 13ms or faster vendor-rated average access time; if vendor reports performance as average seek time, 10ms or faster.

Capacity: 500MB or greater.

Size: Half-height or full-height, depending on your system's drive bays.

Interface: IDE for desktop systems with up to 1GB of capacity. For larger capacities, get a SCSI-2 drive interface.

Features and Options: Self-parking heads, diagnostic and partitioning software, spindle synchronization for use in redundant arrays of inexpensive disks (RAIDs), single-ended SCSI-2 support (if it's a SCSI drive).

Cache or Buffer: 64K to 256K (a 512K segmented cache is top-of-the-line).

RED FLAGS: Mounting brackets and cables should come with the disk; look for a 30-day full money-back guarantee, a three- or five-year warranty, and a mean-time-between-failure rating of at least 200,000 hours.

CD-ROM DRIVES



Access Time: 200ms.

Transfer Rate: Dual-speed drive—150Kbps to 300Kbps.

Ondrive Cache: 64K.

Interface: SCSI-2.

Compatibility: High Sierra and ISO-9660 (data), CD-Audio, and Kodak Photo CD (still photography) with multisession support (MPC 2).

Audio: Output jack and volume control.

Packaging: Internal.

Features and Options: Bundled CD-ROMs, single-handed operation, newer CD-ROM drives support 450Kbps and 600Kbps transfer rates. Support for new CD-ROM XA (extended architecture) is a nice option but this standard appears to be waning. Double doors are useful in dusty environments, caddyless designs are more convenient.

Other Requirements: If you buy a CD-ROM drive that requires a disk caddy, make sure one comes with it.

RED FLAGS: Proprietary interfaces and drives that don't support MPC-2 will probably work with fewer software and hardware products.

SINGLE-USER TAPE DRIVES



Storage Capacity: 250MB when compressed.

Packaging: Internal 3½-inch drive preferred; external for PC-to-PC portability.

Interface: Floppy drive, IDE, or SCSI.

Cartridge Type: DC6250, DC2120, or equivalent, preformatted; for higher capacities, look at 4mm DAT drives.

Bundled Software: Windows and DOS backup software that supports either QIC-80 or QIC-525 tape format.

Other Requirements: Floppy interface splitter or other interface cable, mounting hardware for internal drives.

RED FLAGS: Ensure full QIC-80 compatibility for mini-cartridge drives; avoid proprietary controller cards—they may take up an extra slot in your system; try for a price below $1 per megabyte.

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- 270MB **SyQuest** Removable — $599
- Double Speed **CD-ROM** — $299

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Circle 230 on reader service card.

HAND SCANNERS



Scan Window: 4 to 5 inches wide.

Image Editing Software: Ability to crop, flip, rotate, reduce, and enlarge images; basic paint tools with brush selection; special effects such as reverse colors, embossing, and mosaics.

Resolution: 300 dpi; 400 dpi with interpolation.

Image Type: 24-bit color for presentations and transparencies; 8-bit grayscale for desktop publishing and OCR.

Color Control: Manual controls for contrast and brightness; software utility for calibrating colors on monitor and printer.

File Formats: EPS and JPEG support in addition to PIX, TIFF, bitmap, and GIF.

Scan Controls: Visual and/or audio alarms for scan speed; automatic deskewing; "autostitch" for sewing together up to four strips of an image.

Industry Standard: TWAIN compliant.

REO FLAGS: To view work from a 24-bit color scanner, you'll need a 24-bit video card.

FLATBED COLOR SCANNERS



Resolution: 400 to 600 dpi.

Image Type: 24-bit color (16.7 million colors), grayscale (256 shades of gray), black and white.

Industry Standard: TWAIN compliant.

Interface: SCSI-2.

Image Controls: External controls for adjusting brightness, contrast, and color of scan; adjustable resolution.

Bundled Software: 24-bit image-editing software, OCR software.

Features and Options: Automatic document sheet feeder, transparency feeder, free replacement scanner bulb, color calibration feature.

Other Requirements: Cables and SCSI adapter card included in price.

REO FLAGS: Watch for vendors that cite interpolated resolution rather than optical resolution. Interpolation uses software to fill in spaces between pixels. The quality of interpolation algorithms varies greatly.

ETHERNET ADAPTERS



Card Type: 16 bit, ability to autoconfigure to 8 bit.

Network Support: NetWare, LAN Manager, LAN Server, Windows for Workgroups, Windows NT Advanced Server.

Drivers: Support for NDIS and ODI drivers, or Eagle NE2000–compatible drivers.

Media Connectors: For 10Base2 (Thinnet) and 10Base-T (RJ-45); automatic sensing of media configuration.

Installation: Should be software configurable and support interrupt levels above IRQ 7.

Features and Options: Upgradable boot PROM, SNMP support, collision and link status LEDs, bus-mastering interface, built-in virus scanning, downloadable flash boot PROM, 10Base5 (thick Ethernet) connector, full-duplex Ethernet support.

Other Requirements: Diagnostic utilities, slot-bracket mounted, transmission and reception LEDs, 16K or larger buffer.

REO FLAGS: Cards that support only 8-bit buses can restrict CO performance.

ALL-IN-ONE MODEMS



Transmission Rate: 14.4Kbps without compression, 57.6Kbps with compression.

Supported Standards: V.32bis (data speed); V.42 (error correction); V.42bis (data compression); CCITT Group 3 Class 1, Class 2, and CAS (fax).

Compatibility: Hayes command set.

Port Selection: COM1 through COM4.

Bundled Software: DOS and Windows communications and fax software, OCR software.

Features and Options: Integrated voice, data, and fax; onboard digital-signal processor and coprocessor; 16550 universal asynchronous receiver/transmitter (UART); LCD display on external modems; upgradability to V.fast (V.34) protocol.

REO FLAGS: Fax modems without fallback transmission rates may not connect with other machines.

Zenith Data Systems

Z-NOTEFLEX Multimedia Notebook

Modular architecture for a multitude of user-upgradable features.

- ▲ User upgradable processor, memory, hard drive, display and more
- ▲ 4MB RAM exp. to 24MB
- ▲ 32-bit VL local bus video
- ▲ Detachable video display
- ▲ Built-in 16-bit stereo sound with speaker and microphone
- ▲ Integrated trackball
- ▲ Two Type II or one Type III PCMCIA slot
- ▲ MS-DOS, Windows for Workgroups, Indeo Video
- ▲ 3-Year Warranty

Processor	RAM	Screen	Hard Drive	Price
486SX/33	4MB	10.4" mono	200MB	$2449
486DX2/50	4MB	10.3" dual scan	200MB	$2869
486DX2/50	4MB	10.3" dual scan	340MB	$3149
486DX2/50	4MB	9.5" active	340MB	$4339
486DX2/50	8MB	9.5" active	450MB	$4759
486DX4/75	8MB	9.5" active	520MB	$5339

as low as **$2449**



ZENITH DATA SYSTEMS

Z-NOTEFLEX ACCESSORIES

FLEXDOCK port replicator	$219.99
FLEXBAY floppy bay/battery recharger	$159.99
FLEXSHOW Multimedia Companion	$799.99
FLEXSITE LCD Display Stand	$199.99

Z-STAR EX

High-end features at a low-end price!

- ▲ Cyrix 486DX2/50 processor
- ▲ 4MB RAM expandable to 20MB
- ▲ Modular design with removable hard drive & floppy drive
- ▲ 32-bit VESA local bus graphics, 512KB video RAM
- ▲ Two Type II or one Type III PCMCIA slot
- ▲ Modem/audio module slot
- ▲ Enhanced J-Mouse pointing device
- ▲ Built-in AC adapter
- ▲ MS DOS, Windows 3.1 and CoSession Host software
- ▲ 1 Year Z-CARE on-site service

Processor	RAM	Screen	Hard Drive	Price
486DX2/50	4MB	9.5" monochrome	200MB	$1699
486DX2/50	4MB	9.5" dual scan	200MB	$2179
486DX2/50	8MB	9.5" dual scan	340MB	$2549
486DX2/50	4MB	9.5" active matrix	340MB	$3309

as low as **$1699**

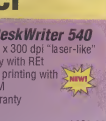


Z-PLAYER Multimedia Unit

$499.99

A complete portable multimedia solution for any PCMCIA notebook!

- ▲ Integrated double-speed CD-ROM drive, 16-bit stereo sound, speakers & audio in/out ports
- ▲ PCMCIA Type II interface included
- ▲ Upgrade any notebook with PCMCIA to a full multimedia machine in one easy step



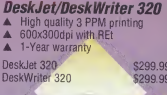
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- ▲ 4PPM
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NEW!

- ▲ Sharp, 600x300dpi "laser-like" print-quality with ColorSmart
- ▲ 2MB memory expandable to 26MB
- ▲ 180 sheet paper tray
- ▲ 1-year warranty

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DeskJet 1200C/PS

- ▲ 45 scalable fonts w/Adobe Postscript Level 2
- ▲ 4MB memory expandable to 20MB
- ▲ 1-year warranty

DeskJet 1200C/PS $1969.99

DeskJet/DeskWriter 320

- ▲ High quality 3 PPM printing
- ▲ 600x300dpi with REt
- ▲ 1-year warranty

DeskJet 320	$299.99
DeskWriter 320	$299.99

NEW!



DeskJet 320

DeskJet/DeskWriter 540

- ▲ Sharp, 600 x 300 dpi "laser-like" print quality with REt
- ▲ 15% faster printing with 512KB RAM
- ▲ 3-Year warranty

NEW!

DeskJet 540	$289.99
DeskWriter 540	$289.99

DeskJet/DeskWriter 560C

- ▲ Color 600 x 300 dpi "laser-like" print quality
- ▲ Resolution Enhancement Technology for smooth, crisp text and graphics
- ▲ 3-Year warranty

DeskJet 560C	$479.99
DeskWriter 560C	$479.99

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- Built-in AC adapter
- Removable hard drive
- 2 Type II or 1 Type III PCMCIA slots
- Integrated trackball
- MS-DOS 6.0, Windows 3.1, MS Video for Windows Runtime

Processor	Display	Hard Drive	Price
486DX2/40	9.5" Dual scan	170MB	$3119
486DX2/40	8.4" Active	170MB	$3779
486DX2/40	8.4" Active	340MB	$4159
486DX2/50	9.5" Mono	250MB	$3299
486DX2/50	9.5" Active	340MB	$4999
486DX4/75	9.5" Active	340MB	$5569
486DX4/75	9.5" Active	510MB	$6139

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LTE Elite

COMPAQ

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- Type II PCMCIA slot
- Integrated trackball
- Weighs only 3.5 lbs.(mono), 4.3 lbs. (color)
- MS-DOS 6.0 Windows 3.1

Processor	Display	Hard Drive	Price
486SX/25	8.0" Mono	170MB	$1139
486SX/33	7.8" Passive	170MB	$1499
486SX/33	7.8" Passive	250MB	$1799

Lease for $50/mo.



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ProLinea Desktops

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- Pentium upgradable
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- Local bus graphics
- MS DOS 6.0, Windows 3.1

Processor	RAM	Hard Drive	Price*
486SX/33	4MB	200MB	$1049
486DX2/50	4MB	200MB	$1289
486DX2/66	4MB	340MB	$1489
486DX2/66	4MB	525MB	$1639
486DX4/100	8MB	340MB	$1999
486DX4/100	8MB	525MB	$2139

*Compaq color monitors start at $259.99

AST Value

Ascentia 900N 10.4" Active Matrix screen now available!

Ascentia 800N

- 486SX/33 or DX2/50 processor
- 4MB RAM expandable to 20MB
- 9.5" Dual scan color display
- PCMCIA Type III slot

Model	Hard Drive	Price
433s Model 253W	250MB	$2299
433s Model 343W	340MB	$2499
450d Model 253W	250MB	$2599
450d Model 343W	340MB	$2739

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Bravo LC Desktops

New Generation!

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- VESA local bus graphics
- 1MB video RAM
- MS-DOS 6.2, Windows 3.1
- Energy Star Compliant

Model	RAM	Hard Drive	Price
433s Model 273W	8MB	270MB	$1369
450s Model 173W	4MB	170MB	$1199
450s Model 273W	8MB	270MB	$1439
466d Model 273W	8MB	270MB	$1699
466d Model 543W	8MB	540MB	$1829

AST Color Monitors Start at $369.99

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Ascentia 900N

- 486DX2/50 or 486DX4/75 [illegible]
- 4MB/8MB RAM exp. to 32MB
- Large Dual Scan or Active color display
- PCMCIA type III slot

Model	Screen	Hard Drive	Price
450d Model 343W	10.3" Dual scan	340MB	$[illegible]
450d Model 343W	9.5" Active	340MB	$[illegible]
475 Model 343W	10.3" Dual scan	340MB	$[illegible]
475 Model 515W	10.4" Active	510MB	$[illegible]

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Ascentia 900

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Satellite Notebooks

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- 9.5" display
- Type III PCMCIA slot
- 82-key keyboard
- MS-DOS, Windows 3.1
- Ballpoint mouse with Quickport
- Enhanced power management

Model	Processor	Screen	Hard Drive	Price
T1910	486SX/33	9.5" Mono	200MB	$1499
T1910	486SX/33	9.5" Dual scan	200MB	$2039
T1960	486DX2/50	9.5" Dual scan	200MB	$2379
T1960	486DX2/50	9.5" Dual scan	320MB	$2629
T1960	486DX2/50	8.4" Active	200MB	$3029
T1960	486DX2/50	8.4" Active	320MB	$3259

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T1910

T4700 and T4800

- 8MB RAM, expandable to 24MB
- Brilliant 9.5" display with local bus video
- 2 PCMCIA slots (Type II, Type III)
- Microsoft Sound System, built-in microphone, audio out port
- MS-DOS, UltraFont, Indeo video compression software, Windows for Workgroups 3.11

Model	Processor	Screen	Hard Drive	Price
T4700	486DX2/50	9.5" Active	200MB	$4549
T4700	486DX2/50	9.5" Active	320MB	$4899
T4800	486DX4/75	9.5" Active	500MB	$5599

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T4800

T3400

- Ultra-portability at only 4.1lbs
- 486SX/33 or 486DX2/50 processor
- 4MB RAM, expandable to 20MB
- PCMCIA Type II slot
- External 3.5" disk drive
- Integrated AccuPoint pointing device

Processor	Screen	Hard Drive	Price
486SX/33	7.8" Active Color	250MB	$2899
486DX2/50	8.4" Active Color	250MB	$4069

Lease for $106/mo.

HOT PRODUCT

T2400

- 486DX2/50 processor
- 2 PCMCIA slots (Type II, Type III)
- Integrated AccuPoint pointing device
- Optional sound card
- MS-DOS, Windows for Workgroups

Screen	Hard Drive	Price
9.5" Dual Scan	250MB	$2929
9.5" Dual Scan	320MB	$3089
8.4" Active Color	250MB	$3639
8.4" Active Color	320MB	$3799

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TravelMate 4000M

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- ▲ PCMCIA Type III slot

Processor	Screen	Hard Drive	Price
486DX/25	8.2" Enhanced Color	120MB	$2099
486DX/50	8.2" Dual Scan	200MB	$2759
486DX2/50	8.4" Active	340MB	$3349
486DX4/75	9.5" Dual Scan	455MB	$4439
486DX4/75	8.4" Active	340MB	$4889

TravelMate Intelligent Docking System

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- ▲ Auto Load/Eject feature

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TravelMate 4000E Color

Processor	Screen	Price
486SX/25	8.2" Enhanced Color	$1699
486DX2/40	8.2" Enhanced Color	$2069
4B6DX2/50	9.4" Dual Scan	$2319
486DX2/50	8.4" Active Matrix	$2819
486DX4/75	8.4" Active Matrix	$3549
486DX4/75	9.5" Active Matrix	$4489



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TM 4000M

ThinkPad® 360 notebooks

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- ▲ Local Bus Graphics with 1MB video RAM
- ▲ 2 Type II or 1 Type III PCMCIA slot
- ▲ TrackPoint II integrated pointing device
- ▲ Port Replicator and Docking Station available
- ▲ IBM DOS 6.3, Windows 3.1, Lotus cc:Mail, Organizer, ScreenCam, Official Airline Guide FlightDisk, CoSessions Host, Prodigy, America Online, and FaxWorks 3.0

Screen	Hard Drive	Price
9.5" Monochrome	170MB	$1939
9.5" Monochrome	340MB	$2419
9.5" Dual Scan	170MB	$2519
9.5" Dual Scan	340MB	$2999
8.4" Active Color	170MB	$3389
8.4" Active Color	340MB	$3869

as low as $1939

HOT PRODUCT

ThinkPad® 360

ThinkPad® 510 subnotebook

- ▲ IBM 486BL2/50 processor
- ▲ 4MB RAM exp. to 20MB
- ▲ 200MB hard drive
- ▲ 7.7" color display
- ▲ Type II PCMCIA slot
- ▲ TrackPoint II integrated pointing device
- ▲ 3.5" external floppy drive
- ▲ Weighs only 3.8 lbs. (w/battery)
- ▲ IBM DOS 6.3, Windows 3.1, Lotus cc:Mail, Organizer, ScreenCam, Official Airline Guide FlightDisk, CoSessions Host, Prodigy, America Online, and FaxWorks 3.0

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- ▲ 486DX2/50
- ▲ 4MB expandable to 20MB
- ▲ 2 Type II PCMCIA slots
- ▲ MS-DOS 6.2, Windows 3.1, built-in trackball
- ▲ Removable hard drive
- ▲ Removable floppy – add second battery

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- ▲ VESA local bus graphics
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- ▲ SoundBlaster 16 sound card
- ▲ Speakers, microphone
- ▲ 24/96 fax modem
- ▲ MS-DOS, Windows, Quicken
- ▲ CD titles: Compton's Encyclopedia, PFS Window Works

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486DX2/66 desktop	340MB	$1539
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Versa M

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- ▲ Removable screen
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Processor	Hard Drive	Screen	Price
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UltraLite Versa S

- ▲ 486 processor
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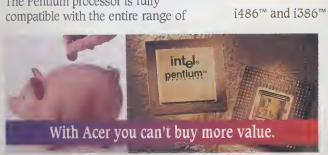
The AcerPower™ Pentium workstation represents the next technological leap forward by combining unparalleled 90MHz Pentium-based processing with the high-speed PCI local bus, for the ultimate in power and speed. The fast throughput of this system gives you the high-performance needed for the future with true-color, full-motion video and 3-D graphics. And PCI also allows automatic configuration of new peripherals as you install them into your system.

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- Panasonic 2X CD-ROM Drive
- Local Bus IDE
- 1.44MB Diskette Drive
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- 2 PCI 64-Bit Expansion Slots, 4 ISA 16-Bit Expansion Slots
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- Local Bus IDE
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- PCI Enhanced Local Bus IDE
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 15" .28mm Non-Interlaced Digital SVGA Color Monitor
- 2MB 64-Bit PCI Nitro Windows Accelerator Card
- 2 PCI Expansion Slots, 4 ISA 16-Bit Expansion Slots
- 1 Combination PCI/ISA Expansion Slot
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- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
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- 1 Combination PCI/ISA Expansion Slot
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- 128KB Second-Level Cache
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- 2MB 64-Bit PCI Nitro Windows Accelerator Card
- Panasonic 2X CD-ROM Drive
- 1.44MB Diskette Drive
- 15" .28mm Non-Interlaced Flat Screen Digital SVGA Color Monitor
- 2 PCI Expansion Slots, 4 ISA Expansion Slots
- 1 Combination Expansion Slot
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/Entertainment Packs, Works for Windows, and Quicken

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- 8MB System RAM (Expandable to 64MB)
- 128KB Second-Level Cache
- 420MB IDE Fast Hard Disk Drive
- 2MB 64-Bit PCI Nitro Windows Accelerator Card
- Panasonic 2X CD-ROM Drive
- Local Bus IDE
- 1.44MB Diskette Drive
- 15" .28mm Non-Interlaced Flat Screen Digital SVGA Color Monitor
- 2 PCI Expansion Slots, 4 ISA 16-Bit Expansion Slots
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Convenient, upgradable architecture has arrived with the AcerNote 780cx. It features a revolutionary modular design that makes upgrading components and servicing easy. That's important, because when you're traveling with your notebook, your system administrator won't be around to help you.

Add New Features As They Are Announced

As higher capacity hard drives become available, you can plug them in yourself with the easy-to-open Acer SmartCase.™ And look forward to being able to grow into the latest and greatest features as they are announced.



PCMCIA Gives You Easy Communication

You can simply slide in a credit card-sized PCMCIA card that lets you tap into your network, send information to a fax machine via modem, access additional storage devices or plug in more memory. And once you return to the office, you can easily transfer your new data to your desktop.

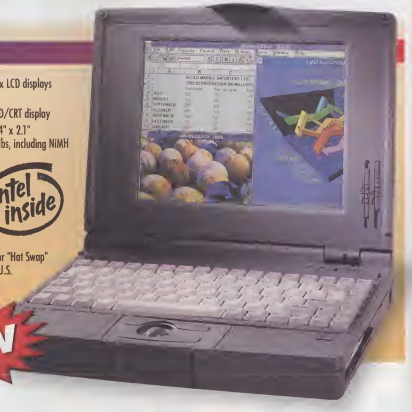
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- Easily upgradable 500MB 2.5" hard drive
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- EasyTrac™ centrally located removable trackball
- 2 PCMCIA Type II Slots/1 Type III Slot
- 1.44MB diskette drive
- Local bus accelerated graphics
- Suspend-to-Disk feature, "No-Reboot" CMOS setup and Suspend-Resume hot button preserve battery life
- 9.5" active-matrix LCD displays 256 colors
- Simultaneous LCD/CRT display
- Slim 8.66" x 11.4" x 2.1" case weighs 6.4 lbs, including NiMH battery pack
- Graphic battery gauge indicates remaining battery life
- One year 24-hour "Hot Swap" warranty in the U.S. and Canada

intel inside



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NEW

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Expandability For Tomorrow, Power For Today

The AcerNote 760 series gives you all the expandability of the 780cx, plus more power than many current desktop PCs. The high performance of the Intel486™DX2/50MHz processor, combined with local bus architecture, gives you the power to take all your projects on the road with you, not just the less demanding ones.

AcerNote Gives You Easy Upgrades!

You also get the same convenient, upgradable architecture in the AcerNote 760 series as in the higher-priced 780cx. A revolutionary modular design makes upgrading components and servicing easy. If you're on the road when you need more storage or memory, you can simply plug in off-the-shelf components yourself.

Suspend/Resume Hot Button Saves You Time!

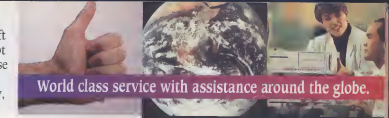
The AcerNote 760 series offers time-saving benefits for the traveler, including the ability for you to jump right back into your applications from where you left off. By using a "hot button" you can close down and re-enter your work instantly, without having to wait for the usual boot-up procedure. This power-saving feature assures a 3-5 hour battery life.

Assistance Around The Globe

Because the most powerful notebook does you no good if it's not working when you need it, the AcerNote series is backed by a one-year, 24-hour replacement warranty in the U.S. and Canada. To assure you support in over 20 countries worldwide, a free one-year Acer International Travelers Warranty is also included.

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- i486DX2/50MHz Processor with Built-In 8KB Cache
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- 2 PCMCIA Type II Slots/1 Type III Slot
- 9.5" Active-Matrix LCD Displays 256 Colors
- 340MB 2.5" Hard Disk Drive
- Palmrest with Integrated Trackball
- 1.44MB Diskette Drive
- Local Bus Accelerated Graphics
- MS-DOS 6.2, Microsoft Windows 3.1
- International Travelers Warranty
- 24-hour "Hot Swap" Warranty in the U.S. and Canada

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- 9.5" Dual-Scan LCD Color Display
- 209MB 2.5" Hard Disk Drive
- Palmrest with Integrated Trackball
- 1.44MB Diskette Drive
- Local Bus Accelerated Graphics
- MS-DOS 6.2, Microsoft Windows 3.1
- International Travelers Warranty
- 24-hour "Hot Swap" Warranty in U.S. and Canada

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AcerNote 760c i486DX2/50MHz

- i486DX2/50MHz processor with built-in 8KB cache
- 4MB system RAM
- SmartCase easy-to-open modular housing for upgradability and serviceability
- Easily upgradable 340MB 2.5" hard drive
- Easy-to-remove keyboard for quick memory and BIOS upgrade
- EasyTrac centrally located removable trackball
- 2 PCMCIA Type II Slots/ 1 Type III Slot
- 1.44MB diskette drive
- Local bus accelerated graphics
- Suspend-to-Disk feature, "No-Reboot" CMOS setup and Suspend-Resume hot button preserve battery life
- 9.5" dual-scan LCD
- Simultaneous LCD/CRT display
- Slim 8.66" x 11.4" x 1.8" case weighs 6.4 lbs, including NiMH
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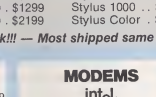
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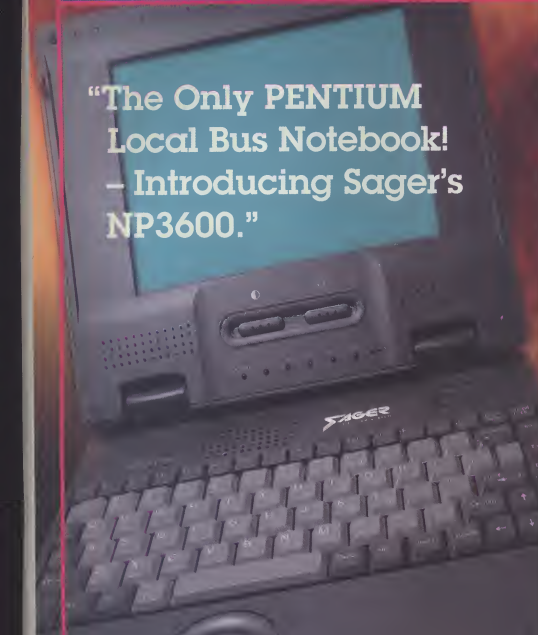
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PENTIUM NP3600 CONFIGURATIONS

- Intel Pentium™ 60/66MHz CPU
- 1MB Video RAM
- 32-bit VESA Local Bus Video with Windows Accelerator
- 32-bit Local Bus IDE
- Built-In Audio Chip, Microphone, & Speaker
- 8MB RAM Expandable to 40MB
- Removable 260MB Hard Drive (340, 520MB Optional)
- 3.5" 1.44MB Floppy Drive
- 10.3" Dual Scan or 9.5" Active Matrix VGA Display, CRT. 1024x768 256 Colors
- Simultaneous CRT & LCD Operation
- Extra Large Built-In 25mm Trackball
- 1 Type II & 1 Type III PCMCIA Slots
- 46 Watt NiMH Battery
- 1 16C550 Compatible Serial Port
- 1 Parallel Port with ECP/EPP Support
- Ports for Ext. Keyboard, Ext.VGA Monitor & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 8.1Slbs (with Battery)
- 11.14"W x 10.31"D x 2.56"H
- Sager's Umbrella Protection Policy

NP3600 FEATURES

- Intel Pentium™ 64-bit performance
- Super Fast 32-bit VESA Local Bus Video with Windows Accelerator & 1MB Video RAM
- 32-bit Local Bus IDE, improved data transfer rate of up to 45%
- 1 PCMCIA Type III & 1 PCMCIA Type II Slots
- Built-in Audio Chip, Microphone, & Speaker (Now you can record, compress, store and playback voice, sound, and music to disk. Soundblaster and Microsoft Windows Sound System compatible)
- VESA Local Bus Power when used with Optional VL-Bus Docking Station
- 46 Watt Extra Large NiMH Battery
- Extra Large Built-In 25mm Trackball
- Large Palm Rest Area for Easy Typing
- Flash ROM for BIOS Upgrade through software
- 2-Hour Quick Charge

NP3600 / NP7500 OPTIONS

VL-Bus Docking Station
Numeric keypad
Car Adapter
PCMCIA Cards (Fax/Modem, Ethernet LAN Adapter, SCSI Adapter & more)

R T A B L E S



486 NP7500 CONFIGURATIONS & FEATURES

- Intel SL enhanced CPU upgradeable to 486DX4 (486SX>DX>DX2>DX4)
- 1MB Video RAM
- Super Fast 32-bit VESA Local Bus Video with Windows Accelerator
- Super Fast 32-bit Local Bus IDE with improved data transfer rate of up to 45%
- Built-in Audio Chip, Microphone, & Speaker (Now you can record, compress, store and playback voice, sound, and music to disk
- Extra Large Capacity NiMH Battery – No Memory Effect and 40%-50% Longer Running/Operating Timespan
- Large 19mm Trackball Centered on Large Palm Rest Area for Easy Typing
- 2 PCMCIA Type I & II or 1 Type III IC Card Slot
- Flash ROM for BIOS Upgrade through software
- 4MB RAM expandable to 36MB
- Removeable 250MB Hard Drive (340, 520MB Optional) offers flexibility, upgradeability and security
- 3.5" 1.44MB Floppy Drive
- 9.5" 640x480 VGA Display 256 Colors or 64 Grays, CRT: 1024x768 256 Colors
- Simultaneous CRT & LCD Operation
- 180° LCD Display Angle Rotation
- Built-in System Management Mode (SMM)
- Ports for 1S, 1P, Ext keyboard, Ext VGA monitor, & 200 Pin Connector for Docking Station
- Jacks - 1 line in & 1 line out
- 86-Key Keyboard
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 6.6lbs. (with Battery)
- 11.14"W x 9.48"D x 1.95"H



486 NP700 CONFIGURATIONS

- 1MB Video Ram
- 4MB RAM expandable to 16MB
- Removeable 120MB Hard Drive (250, 340, 520MB Optional)
- 3.5" 1.44MB Floppy Drive
- 9.5" 640x480, VGA Display 256 Colors or 64 Gray Shades
- Large Built-In 16mm Trackball (Can be replaced with another module)
- PCMCIA Type I & II Slot
- Ports for 1S, 1P, Ext keyboard/keypad, VGA monitor & AT/Bus for expansion box
- 85-Key Keyboard
- Nickel Metal-Hydride battery
- Microsoft DOS 6.22
- Carrying Bag & AC/Adapter
- Weight 5 5lbs. with Battery
- 11.4"W x 8.6"D x 1.65"H
- Sager's Umbrella Protection Policy

NP700 FEATURES

- Module Pack Area: (Optional) Fax/Modem, PS/2 Mouse+COM 2, Audio
- PCMCIA Slot
- Intel 486 Upgradeable CPU (486SX >486DX >486DX2)
- 180° LCD Display Angle Rotation
- 2-Hour Quick Charge
- NiMH Battery: No memory effect, Longer Battery Life
- External Battery Pack: (Optional) Doubles Running Hours Screws Into Bottom Back of Notebook Raising & Angling Keyboard for Easy Typing

NP700 OPTIONS

FAX/Modem Module
PS/2 Mouse + COM 2 Port Module
Audio Module
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811MB	10ms	CFA810A	$399
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SCSI			
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342MB	12ms	LPS340S	$235
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728MB	12ms	70G8511	$329
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105MB SQ3105S	$229	$389	$339
200MB SQ5200C	$299	$599	$519
270MB SQ3270S	$369	$559	$489
	Drive	PC Kit	Portable
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270MB SQ3270A	$369	$469	$559

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XM3401	$425	$549	$425	$479
CDR510	$499	$619	$499	$559
PX43CH	$659	$779	$659	$699

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Symantec pcAnywhere V5.0 DOS	109.54
Symantec pcAnywhere V5.0 WIN	89.98
Symantec Q&A V4.0 WIN	249.58
Symantec Q&A V4.0 WIN	155.11
Symantec Q&A V4.0 WIN comp upg	155.11
Symantec XTree Gold V1.0 DOS	61.30
Symantec XTree Gold V1.0 WIN	61.30
Timeslips V5.0	179.23
Timeslips V5.1 WIN	181.17
Trakking Off Lease Trakking Off Pro	89.98
Trakking Off Leases V1.0 DOS	97.84
Trakking Off Pro V1.0 WIN	89.98

COMPUTER DISCOUNT WAREHOUSE

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Color subnotebook computer
- SL-enhanced Intel 486SX/33 CPU
- 4MB RAM std., 20MB max.
- 170MB or 260MB hard drive
- Passive-matrix color display
- PCMCIA slot: 1) Type II 2) Type III
- Weight: 4.0 lbs.

SPECIAL PURCHASE

170MB ..... $1399.00 CDW 41369
260MB ..... $1499.00 CDW 41370

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Hewlett-Packard DeskJet 560C Color Inkjet Printer
- Laser-quality 600x300 dpi; special paper not required
- Up to 3ppm print speed (black only)
- Dual ink cartridge system—prints color and black simultaneously
- 100 sheet feeder

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ONLY ..... $516.55 CDW 38421

HARDWARE, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

NETWORKING PRODUCTS

NOVELL
Netware V4.02

5 User OD: 776.37
10 User OD: 1765.66
25 User OD: 2888.41
50 User OD: 3439.78
100 User OD: 4784.61

Netware V3.12

5 User 3.5": 577.75
10 User 3.5": 1297.55
25 User 3.5": 1898.00
50 User 3.5": 2599.00
100 User 3.5": 3999.00

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1 User 99.80
5 User 359.52

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TC5143 Ethernet coax 8pk 657.25
TC5143-T Ethernet 10BT 99.80
TC5143 10BT 10BT 8pk 469.66
TC6242 ARCNET 8-bit coax 166.85
TC6243 ARCNET coax 179.89
TC9043 ARCNET passive 4 port hub coax 39.50
TC5358 Ethernet 10BT combo 339.47
TC4545 Token Ring 16/4 ..... 309.33

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ARTISOFT

NodeRunner 2000A 217.58
NodeRunner 2000T 199.19
NodeRunner 3000A 169.01
NodeRunner 3000A 8pk 90.92
NodeRunner 3000T 8pk 79.70
NodeRunner/SI 2000C 75.70
AirModem 14.4 ..... 1.49
LANtastic 5.0 5 user 249.00
LANtastic 5.0 Starter Kit 229.13
Central Station 5 ..... 229.13
10BT 5 port internal hub 292.72
NodeRunner starter kit WIN 515.00
Simply LANtastic starter kit 115.00
Ethernet 8 port 10BT 47.99
Thurnet 8 port 10BT 29.02
T-Runner 12 port 10BT 455.41

SMC

Ultra16 Ethernet coax 105.25
Ultra16 coax 8pk 879.29
Ultra16 Ethernet 10BT 105.25
Ultra16 10BT 8pk 834.20
Ultra16 combo 105.25
Ultra16 combo 8pk 834.20
Ultra16 combo 8pk 699.21
EtherCard+ 1252.32
EtherCard+ Elite coax 119.84
EtherCard+ Elite coax 8pk 939.73
EtherCard+ Elite MCA coax 169.12
EtherCard+ Elite 10BT 119.84
EtherCard+ Elite 10BT 8pk 919.81
EtherCard+ Elite MCA 10BT 181.57
EtherCard+ Elite MCA 10BT 879.78
EtherCard+ Elite combo 139.57
EtherCard+ Elite combo 8pk 1099.73
3008 Ethernet 8 port hub 10BT 348.55
3016 Ethernet 16 port hub 10BT 648.55
PC3000 ARCNET coax 119.69
PC3000 ARCNET TP 119.88
PC130 ARCNET coax 88.50
ARCNET 8 port active hub coax 209.41
TokenCard Elite 16/4 ..... 349.48

3Com

3C503 Etherlink II coax 159.44
3C509 Etherlink III coax 115.00
3C509 Etherlink III coax 5pk 549.00
3C509 Etherlink III 10BT 115.00
3C509 Etherlink III 10BT 5pk 442.36
3C509 Etherlink III combo 132.73
3C509 Etherlink III combo 5pk 632.00
3C579 Etherlink EISA coax 229.01
3C579 Etherlink EISA 10BT 229.01
3C16DT 12 port Linkbuilder 10BT 929.94

NETWORKING PRODUCTS

OTHER TOP-QUALITY NAME BRANDS

Eagle NE2000+ coax 81.30
Eagle NE2000+ 10BT-TPA 97.31
Eagle NE3200 coax w/ TPA 426.00
Eagle NE3200 10BT-TPA 475.15
National Semi NE2000+ 10BT 87.46

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Xircom

PE3010BC pocket Ethernet coax 309.89
PE3010BT pocket Ethernet 10BT 309.89
PE3012BT pocket Ethernet 10BT 330.31
PA2025Bp pocket ARCNET coax 229.20
Pocket Keyn Ring IR 459.89
PPX03 Parallel port multiplexor 77.80

IBM TOKEN RING

IBM Token Ring 16/4 ISA 409.50
IBM Token Ring 16/4 MCA 489.86
IBM Token Ring MAU 459.86

intel

EtherExpress PRO Flash 10BT 110.07
EtherExpress PRO Flash 10BT 5pk 1049.69
EtherExpress PRO Flash 10BT 20pk 1480.89
EtherExpress PRO Flash combo 115.07
EtherExpress PRO Flash combo 5pk 545.39
EtherExpress PRO Flash combo 20pk 1827.22
EtherExpress 16 coax 87.28
EtherExpress 16 coax 5pk 454.13
EtherExpress 16 coax 20pk 1696.38
EtherExpress 16 MCA coax 156.52
EtherExpress 16 10BT 99.33
EtherExpress 16 10BT 5pk 454.13
EtherExpress 16 10BT 20pk 1696.38
EtherExpress 16 MCA 10BT 156.52
EtherExpress 16 combo 110.77
EtherExpress 16 combo 5pk 545.39
EtherExpress 16 combo 20pk 1827.22
EtherExpress Flash 10BT 111.88
EtherExpress Flash 10BT 5pk 515.62
EtherExpress Flash combo 129.79
EtherExpress Flash combo 5pk 599.13
EtherExpress EISA coax 249.09
EtherExpress EISA 10BT 249.94
NetportExpress 10 CAX 367.07
NetportExpress I 10BT 368.85

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COLORADO
MEMORY SYSTEMS, INC.

Jumbo 120MB internal 99.95
Jumbo 120MB external 129.95
Trakker 250MB parallel port 299.00
Trakker 250MB parallel port 334.49
PowerTape 2.4GB SCSI internal 667.38
PowerTape 2.4GB SCSI external 1077.99
PowerDAT 4GB SCSI external 1127.79

MEGA

Tape 250MB internal 169.27
Tape 250MB external 219.27
Bernoulli 150MB internal SCSI 479.51
Bernoulli 150MB external SCSI 529.51
Bernoulli 150MB PC Powered 494.79
Bernoulli 150MB Transportable 568.26
150MB cartridge 89.27
150MB cartridge 92.80

MICROSOLUTIONS

Backpack 3.5" 1.44MB floppy parallel 153.40
Backpack 3.5" 1.44MB floppy SCSI 153.40
Backpack 340MB HD parallel 439.73
Backpack 2X CD-ROM parallel 364.64
Backpack 250MB tape backup parallel 299.90

SyDOS

Pro Nite 42MB parallel 289.77
Pump 84MB parallel 442.44
Pump w/ 1X IDE adapter external 531.91
Pump 105MB parallel 396.87
Mailer 105MB IDE internal 375.40

TAPE, REMOVABLE & FLOPPY DRIVES

Mountain

ITD-250 250MB IDE internal 149.32
FS8500 305MB IDE internal 449.50
SolarCur II 360MB parallel 399.77
1200-4 4GB SCSI external 2945.39

WYSE TERMINALS

Wyse 35 amber/green/white 299.88
Wyse 55 amber/green/white 323.21
Wyse 55 amber/green/white 323.21
Wyse 60 amber/green/white 279.60
Wyse 150 amber/green/white 355.45
Wyse 160 amber/green/white 329.85
Wyse 350 color 427.40

MULTIMEDIA, SOUND, CD

Creative Labs

Discovery 16 CD 2X kit internal 306.80
Edutainment CD 2X kit internal 433.35
Logitech SoundMan Wave 199.95
Multimedia Office CD 3X kit internal 528.84
Sonic CD 2X kit internal 433.35
SoundBlaster voice add-on 83.62
SoundBlaster voice w/mic edition 74.95
SoundBlaster 16 value edition 99.89
SoundBlaster 16 MCD 139.57
SoundBlaster 16 ASP MCD 159.57
SoundBlaster 16 SCSI 169.89
SoundBlaster 16 ASP SCSI-2 ..... 187.77
SoundBlaster 16 w/CD 249.89
Wavelllaster wavetable upgrde 179.00

Access RW Undator & Kdeg Mopn CD 57.40
Logitech SoundMan Wave 169.95
Logitech SoundMan Wave 199.95
Multimedia Office CD 3X kit internal 528.84
Sonic CD 2X kit internal 433.35
Microsoft Bookshelf 1994 ..... 83.62
Microsoft Bookshelf 1994 CD 74.95
Microsoft Encarta 1994 CD 99.89
Microsoft Windows Snd System 52.95
Microsoft Windows Snd System w/sound 139.57
Mitsumi CD 2X int internal 159.57
Mitsumi CD 2X int internal w/sound 169.89
Orchid SoundWave 32 SCSI 187.77
Orchid CD 2X kit internal w/sound 249.89
Sigma Designs RealMagic Lite 340.66
Sun Moon Star CD 4X kit internal 249.89
Sun Moon Star CD 4X kit internal 285.54
Video Logic SB16Wave 1MB 279.40
Video Logic SB16Wave 4MB 279.40

CD-ROM & OPTICAL DRIVES

Chinon CDX435 CD-ROM int external 249.00
Chinon CDX535 CD-ROM kit external 349.64
NEC 38x external 429.95
NEC 38x external 459.00
NEC 38x internal 429.95
NEC kit Pro 497.80
Pioneer DRM604X Quadrispin 6 disc 1099.34
Pioneer 6028 240MB kit internal 395.42
Plextor 5028 240MB kit external 419.27
Plextor 4plex quad internal 1299.00
Plextor 4plex quad external 1499.00
Sony CDU-541 2X CD-ROM internal 179.85
Sony CDU-535 350ms internal SCSI 215.64
Sydos Parallel Port CD-ROM 389.49
Teac SpeedCup4 4X internal 399.88
Toshiba 3401 SCSI CD-ROM external 399.78
Toshiba 3401 SCSI CD-ROM kit external 449.78
Toshiba 3401 SCSI CD-ROM internal 269.94

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HURTA

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XGT accessories ..... CALL!

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DB III 12X12 4 button 249.90
DB III 12X12 16 button 349.90
DB III 12X18 pressure pen 399.85
Sleek 12X12 16 button 219.84

PLOTTERS, DIGITIZERS & SCANNERS

Mountain

IX4015 color scanner 899.00

Sumagraphics.

Summasketch III 12 X 18 16 button 232.90
Summasketch III 18 X 12 4 button 324.44

HOUSTON INSTRUMENT

HI 7100 A-D size 8 pen 2497.73
HI 7200 A-F size 8 pen 3397.25

HEWLETT PACKARD

ScanJet IIP 505.06
ScanJet IIP document feeder 269.92
ScanJet IICX W/DA-HPIIIA interface 995.72
ScanJet IICX document feeder 674.75
ScanJet IICX transparency adapter 803.86

EPSON

ActionScanner S560DC* 694.25
ES-1200-ProPC 1237.36
*Select EPSON peripherals rebates (Jan 1-Feb 28)

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VGA & SUPER VGA MONITORS

Mag Innovision DX15F 368.00
Mag Innovision MX15F 463.89
Mag Innovision DX17F 867.40
Mag Innovision MX17F 963.29
Magnavox MX17F 622.42
Magnavox CM1581 ..... 1299.00
Magnavox CM1695 14" .28 ..... 249.00
Magnavox CM0699 14" .28 NI 259.00
Magnavox CM0795 17" 1026 ..... 799.00
Magnavox CM0515 15" 1280 ..... 358.85
Magnavox CM0615 17" .28 ..... 1099.00
Magnavox CM0617 17" .28 ..... 719.10
Magnavox CM0617 SPECIAL!* 699.00
*while supplies last

Nanao F340W 14" 645.98
Nanao F560W 17" 977.43
NEC 3V 14" 328.86
NEC 3V 15" 467.80
NEC 3FGe 15" 536.90
NEC 4FGe 15" 1099.00
NEC 5FGe 17" 697.86
NEC 5FGe 17" 1053.20
NEC 6FGe 17" 1497.00
Sony 155F 15" 647.92
Sony 175ES 17" 988.88
Sony 20SE1 20" 1895.00

VGA & SUPER VGA DISPLAY CARDS

ADS VGA vs TV Elite external 159.82
ADS VGA to TV Elite external 199.83
ATI Graphics Xpression ISA 2MB 209.20
ATI Graphics Xpression VLB 2MB 209.20
ATI Graphics Pro Turbo ISA 2MB 369.79
ATI Graphics Pro Turbo ISA 4MB 369.79
ATI Graphics Pro Turbo PCI 2MB 369.79
ATI Graphics Pro Turbo PCI 4MB 599.00
Diamond SpeedStar 24 ISA 1MB 83.69
Diamond SpeedStar 24 ISA 2MB 199.00
Diamond Stealth 64 ISA 2MB 299.00
Diamond Stealth 64 VLB 2MB VRAM 346.84
Diamond Stealth 64 VLB 4MB VRAM 599.00
Hercules Dynamite Pro ISA 2MB 197.48
Hercules Dynamite Pro VLB 2MB 199.32
Hercules Dynamite Pro VLB 2MB 197.48
Hercules Terminator 64 PCI 2MB 369.79
Hercules Terminator 64 VLB 2MB 379.84
Intel Smart Video Recorder ISA 419.99
Intel Smart Video Recorder Pro 419.99
Orchid Kelvin 64 ISA 1MB 147.15
Orchid Kelvin 64 ISA 2MB 194.19
Orchid Kelvin 64 VLB 1MB 147.15
Orchid Kelvin 64 VLB 2MB 194.19

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9:00-5:00 CDT Sat.
Tech Support for Customers
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PC Computing

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Please answer questions below:

1. **Where do you use your computer?** (Check one only)
   A. ☐ Home B. ☐ Business C. ☐ Both

2. **What kinds of computers do you use?** (Check all that apply):
   D. ☐ IBM/Compatible Laptop E. ☐ IBM/Compatible Desktop F. ☐ MAC

3. **Do you plan to buy any of the hardware or software mentioned below in the next three months?** (Check all that apply)

HARDWARE
- G ☐ PC
- H ☐ MAC
- I. ☐ Laptop
- J. ☐ Printer
- K. ☐ Monitor
- L. ☐ Disk/Tape Back-up
- M. ☐ Add-in Board
- N. ☐ Modem
- O. ☐ Input Device
- P ☐ Local Area Network

SOFTWARE
- Q. ☐ Accounting
- R. ☐ Spreadsheet
- S. ☐ Personal Finance
- T. ☐ Desktop Publishing
- U. ☐ Word Processor
- V. ☐ Database Manager
- W. ☐ Graphics
- X. ☐ Utility
- Y. ☐ Communications
- Z. ☐ Windows/Multi-tasking
- 1. ☐ Programming Language/ Compiler
- 2. ☐ Integrated/Multifunction
- 3. ☐ CAD

4. **From which of the following sources do you purchase personal computer products?** (Check all that apply)
   - 4 ☐ Specialty Computer Retail Stores
   - 5 ☐ Mail Order Firms
   - 6 ☐ Direct from Manufacturers
   - 7 ☐ Other

PLEASE PRINT CLEARLY

PCC 11/94-4

Name

Title | Telephone

Company Name

Address

City | State | Zip

5. ☐ Please send me a one-year (12 issue) subscription to PC/Computing for $16.94. (U.S. price); all other countries add $18.00 for additional postage.

PCComputing FREE PRODUCT INFORMATION

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731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756
757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782
783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808
809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834
835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886
887	888	889	890	891	892	893	894	895	896	897	898	899	900												

Please answer questions below:

1. **Where do you use your computer?** (Check one only):
   A. ☐ Home B. ☐ Business C. ☐ Both
2. **What kinds of computers do you use?** (Check all that apply):
   D. ☐ IBM/Compatible Laptop E. ☐ IBM/Compatible Desktop F ☐ MAC
3. **Do you plan to buy any of the hardware or software mentioned below in the next three months?** (Check all that apply):

HARDWARE	SOFTWARE	
G. ☐ PC	Q. ☐ Accounting	V. ☐ Communications
H. ☐ MAC	R. ☐ Spreadsheet	W. ☐ Windows/Multi-tasking
I. ☐ Laptop	S. ☐ Personal Finance	Y. ☐ Programming Language/ Compiler
J. ☐ Printer	T. ☐ Desktop Publishing	2. ☐ Integrated/Multifunction
K. ☐ Monitor	U. ☐ Word Processor	3. ☐ CAD
L. ☐ Disk/Tape Back-up	V. ☐ Database Manager	
M. ☐ Add-in Board	W. ☐ Graphics	
N. ☐ Modem	X. ☐ Utility	
O. ☐ Input Device		
P. ☐ Local Area Network		

4. **From which of the following sources do you purchase personal computer products?** (Check all that apply):
   4. ☐ Specialty Computer Retail Stores 6. ☐ Direct from Manufacturers
   5. ☐ Mail Order Firms 7. ☐ Other

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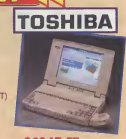
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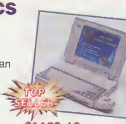


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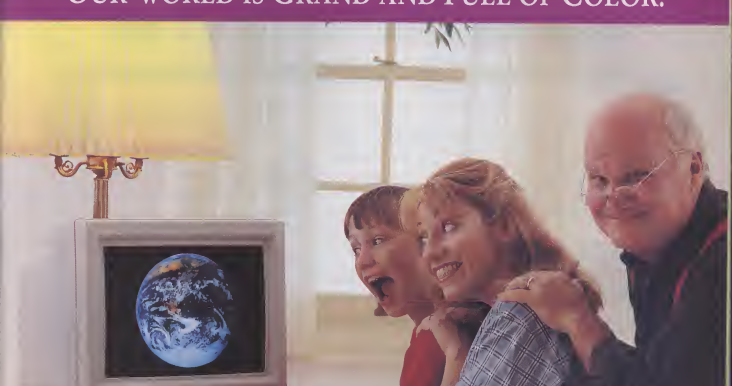
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Max Refresh Rate	70 Hz	70 Hz	90 Hz	90 Hz	105 Hz
Horizontal Scan Freq.	31.5KHz	29KHz - 38KHz	30KHz-57KHz	30KHz-64KHz	24KHz-82KHz
Dot Pitch	N/A	.28mm	.28mm	.28mm	.26mm
110-240VAC (Auto-sensing)	Yes	Yes	Yes	Yes	Yes
MPR II Compliant	No	No	No	Yes	Yes
Energy Star Compliant	Yes	Yes	No	Yes	Yes
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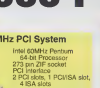
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30F3300 (1Mb)	30-286, 25-386 SX MTHR BD	104.00
30F3301 (4Mb)	55SX	179.00
64F3251 (2Mb)	25-386 SX, 25-386 SX LCD	119.00
64F3300 (4Mb)	80-A21, 3-61, 90-A21, 95-171, 80-311	169.00
64F3301 (8Mb)	70-121, 70-A21, 90-A21, 95-A21, 95-311	299.00
	90-A21, 95-A21, 95-311, 70-121, 70-A21, 486SX	99.00
	90-A, 95-A, 486 SLC Mother Bd, 25-386 SX, 55SX, 486 SX Mother Bd	95.00
64H9659 (2Mb)	90-A21, 95-A21	149.00
64F3252 (1Mb)	Printer 5G Model 20	69.00
34F9251 (4Mb)	350K 450K 550K 650K 655 SX 755	179.00
34F9252 (8Mb)	350K 450K 550K 650K 655 SX 755	299.00
1057519 (1 MB)	PS/2 & PS/1/386SX/20	99.00
1057520 (4Mb)	PS/2 & PS/1/386SX Models 25/21	179.00
1057521 (16Mb)	PS Expert Consultant Model 25/21	399.00
1057522 (2Mb)	Value Point Performance PC Server 486	175.00
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1057526 (4Mb)	Standard 9-bit PS/2 Models 30, 50, 50Z, 55SX, P55, 386SX	99.00
1057527 (16Mb)	Standard 4x9 70 Series	672.00
1057528 (8Mb)	70-121, 70-A21, 90-A21, 95-A21, 95-311	299.00
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1057531 (64Mb)	9585 90, 95, 710, 720 & 9585 90, 95, 9585, P55, 9585A	2599.00
1057532 (128Mb)	Model 710, 720, P70, 9585, 90, P70, 9585A	5199.00
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64H3253 (8Mb)	486SX 486SX	339.00
64H3136 (8Mb)	90 SX 570 A, 90, 95 P-70, 9585	339.00
	90, 95, 9585, P70, 9585A, 9585 P-85	339.00
64H3137 (16Mb)	486, 486SX, 9585	679.00
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Bright 11 (16Meg)	Thinkpad 510CS (3.3 volt)	199.97
Bright 11 (4Meg)	Thinkpad 700C/700CS/700T	199.97
Bright 11 (8Meg)	L440 N5020 P75 Intel Tpad 360, 360c P5 Micro 425	199.97
Bright 11 (16Meg)	L440 N5020 P5 Note	360.00
Bright 11 (32Meg)	701C 720C 720CS 720T	360.00
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33L4116 (8Meg)	Thinkpad 700 720C 720CS	199.97
33L4117 (4Meg)	ELITELITE 4/25, 4/25C, 4/25S, 4/25CS	199.97
33L4117 (16Meg)	ELITELITE 4/25, 4/25C, 4/25S, 4/25CS	399.00
33L4118 (4Meg)	ELITELITE 4/25, Thinkpad 700, 700C, 720, 720C	399.00
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56P8964 (2Meg)	N5020L	199.00
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Deskpro 386/20, 386/20E,	1Meg	110506-001	99.00
486/25, 486/25E,	4Meg	110506-001	179.00
486/50E, System Pro	32Meg Module	110506-001	1399.00
Deskpro 386/25, 386/25E	1Meg	110506-001	99.00
Deskpro 386/25E, 386/33	4Meg	110506-001	179.00
	8Meg	110506-001	359.00
Deskpro 386S /16MHz	1Meg	110506-001	99.00
	4Meg Exp Kit	110544-001	179.00
	8Meg Exp Kit	110544-001	359.00
	16Meg Exp Kit	110544-001	719.00
Deskpro 386/20E	1Meg Exp Kit	110544-001	99.00
Deskpro 386/25E	4Meg Exp Kit	110544-001	179.00
Deskpro 386/33	8Meg Exp Kit	110544-001	359.00
	16Meg Exp Kit	110544-001	719.00
Deskpro 386M 386/M, 386/20E,	4Meg Module	110132-001	179.00
40 "M" series, system LT series,	8Meg Module	110132-001	359.00
41 "I" series	16Meg Module	110132-001	719.00
	32Meg Module	110506-001	1399.00
M Series Exp Bd	1Meg	121160-001	99.00
Deskpro 386/16	4Meg	121160-001	179.00
	8Meg	121160-001	359.00
	16Meg	121160-001	719.00
Deskpro 25M, 33M, 5/66M, 5/66M	ALL OF	110506-001	99.00
Prosignia 5/66	THESE	110506-001	179.00
Prosignia 5/66	MACHINES	110506-001	359.00
Proliant 2000 4/50, 5/66	USE	148501-001	1399.00
Proliant 4000 4/50, 5/66	72PIN	148501-001	1799.00
Proliant 2000 2/66L, 5/66L	168Meg	148501-001	3599.00
	1Meg	141061-001	99.00
Prolinea 486 4/25S 4/33 4/50, 486 DS	2Meg	141061-001	179.00
Universal Printers, Printer 5G	4Meg	141061-001	359.00
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LTE/286	2Meg Exp	110506-001
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LTE/286	16Meg	110506-001
LTE/286, LTE/386	1Meg Module	179219-003
LTE/286, LTE/386	2Meg Module	179219-003
LTE/286, LTE/386	4Meg Module	179219-003
LTE/286, LTE/386	8Meg Module	179219-003
LTE/286, LTE/386	16Meg Module	179219-003
LTE/286, LTE/386	32Meg Module	179219-003
SLT/286	1Meg Module	110506-001
SLT/286	2Meg Module	110506-001
SLT/286	4Meg Module	110506-001
SLT/286	8Meg Module	110506-001
SLT/286	16Meg Module	110506-001
Contura 13T, 20M	4Meg Module	144700-001
	8Meg Module	144700-001
	16Meg Module	144700-001
Contura 320, 325	4Meg Module	139400-001
	8Meg Module	139400-001
	16Meg Module	139400-001
Contura 420S, 425S, 425CX	4Meg Module	139400-001
	8Meg Module	139400-001
	16Meg Module	139400-001
Aero 4/25, 4/33S	1Meg Module	110506-001
	2Meg Module	110506-001
	4Meg Module	110506-001
	8Meg Module	110506-001
	16Meg Module	110506-001

TOSHIBA LAPTOP MEMORY

MODEL	AMT. UPGRADED	IBM/ALL PART #	PRICE
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T1000SE/XE/LE	4Meg	PC1/4 P4S1312	159.00
T3000SE/XE/LE	2Meg	PC1/4 P4S1312	79.00
T3000SE/XE/LE	4Meg	PC1/4 P4S1312	159.00
T3100SX/T3200SX/T3100E/T1600, 1850C C	2Meg	PC-P4S1312	79.00
T3100SX/T3200SX/T3100E/T1600, 1850C C	4Meg	PC-P4S1312	159.00
T3100SX/T3200SX/T3100E/T1600, 1850C C	8Meg	PC-P4S1312	359.00
T1600, 1850C, 1900C/T1600, 1850C C	2Meg	PC-P4S1312	79.00
T1600, 1850C, 1900C/T1600, 1850C C	4Meg	PC-P4S1312	159.00
T1600, 1850C, 1900C/T1600, 1850C C	8Meg	PC-P4S1312	359.00
T1600, 1850C, 1900C/T1600, 1850C C	16Meg	PC-P4S1312	719.00
T1600, 1850C, 1900C/T1600, 1850C C	32Meg	PC-P4S1312	1439.00
T1400CT, T2400, T2400SX	2Meg	PC-P4S2012	79.00
T1400CT, T2400, T2400SX	4Meg	PC-P4S2012	159.00
T1400CT, T2400, T2500	8Meg	PC-P4S2012	359.00
T1400CT, T2400, T2500	16Meg	PC-P4S2012	719.00
T1600	2Meg	PC-P4S1312	79.00
T1600	4Meg	PC-P4S1312	159.00
T1600	8Meg	PC-P4S1312	359.00
T1600	16Meg	PC-P4S1312	719.00
T1700EX	2Meg	PC-P4S1312	79.00
T1700EX	4Meg	PC-P4S1312	159.00
T1700EX	8Meg	PC-P4S1312	359.00
T1700EX	16Meg	PC-P4S1312	719.00
T2000SX	2Meg	PC-P4S1312	79.00
T2000SX	4Meg	PC-P4S1312	159.00
T2000SX	8Meg	PC-P4S1312	359.00
T2000SX	16Meg	PC-P4S1312	719.00
T2000SX	32Meg	PC-P4S1312	1439.00

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ACER 730	16Meg/32Meg		199.00
ACT Apricot Xen	4Meg	52457961	99.00
ACT Apricot 286e	4Meg/8Meg/16Meg		359.00/659.00
ADT Advantage	4Meg/8Meg/16Meg	0312525-001	99.00
AST Bravo LC 4/25S 4/33 4/33S 4/50	4Meg	5009B1-003	179.00
AST Bravo 4/33	4Meg		179.00
AST Power Exec 4/25S	4Meg		179.00
AST Power Exec 4/33S	4Meg		179.00
AST Power Exec 4/50	4Meg	5007R0-001	179.00
AST Power Exec 4/50	8Meg/16Meg	5007R0-001	349.00
Bondwell B315F, SB	2Meg		99.00
Bondwell B315F, SB	2Meg/4Meg/8Meg		199.00
Chicony 1210	4Meg		99.00
Chicony 1210	8Meg/16Meg		199.00
Chicony Ultra Hyundai 386	4Meg		99.00
Compaq LTE 386	4Meg	A5565-11	179.00
Compaq LTE 386	8Meg	PCA 00632-7000	359.00
Compaq LTE 386/20 Contura/s 4/33	4Meg/16Meg		179.00
Compaq LTE 386/20 Contura/s 4/33	8Meg/16Meg		359.00
Compaq LTE 386/20 Contura/s 4/33	32Meg		1439.00
Gateway 2000 386SX/16	4Meg/8Meg	5396-4M	349.00
HP Omnibook 300	2Meg		99.00
HP Omnibook 300	4Meg/8Meg		199.00
HP Omnibook 4000	4Meg/8Meg	2M0 3B0A	199.00
NEC Prospeed 386	2Meg		99.00
NEC Prospeed 386 20/25/33	4Meg	PCR1-01	179.00
NEC Prospeed 386 20/25/33	8Meg	PCR1-02	359.00
NEC Prospeed 386 20/25/33	16Meg	PCR1-03	719.00
Panasonic CF-131 CF131, CF170	2Meg/4Meg/8Meg	CF-VA1/05	99.00
Panasonic CF-131 CF131, CF170	2Meg/4Meg/8Meg		199.00
Samsung 3100 SL	4Meg		99.00
Samsung 3100 SL	8Meg/16Meg	MSC-M8N4M	199.00
Sanyo 1110 MS	4Meg/8Meg/16Meg		199.00
Sharp PC-4500, 4700, 4700, 4700, 4741	2Meg		99.00
Sharp PC-4500, 4700, 4700, 4741	4Meg/8Meg		199.00
Swan 386SX	4Meg		99.00
Swan 386SX	8Meg/16Meg		199.00
Tandon PC Wizard, Datavanti	2Meg/4Meg	M2386SX-2	99.00
Tandon PC Wizard	8Meg	2396-2M0	199.00
TI 4000, TI 4000E	4Meg		99.00
TI 4000, TI 4000E	8Meg/16Meg		199.00
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Wang 382	8Meg/16Meg		199.00
Wang Alliance, Alliance 486SX, EC Serie	4Meg/8Meg/16Meg		199.00
Wang 382	4Meg		99.00
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Zenith Master Series SL, SLE, 500, 425SL	4Meg	ZL-150-92	99.00
Zenith Z-Note 425	4Meg	ZL-150-92	99.00
Zenith Z-Note 425	8Meg	ZL-150-92	199.00
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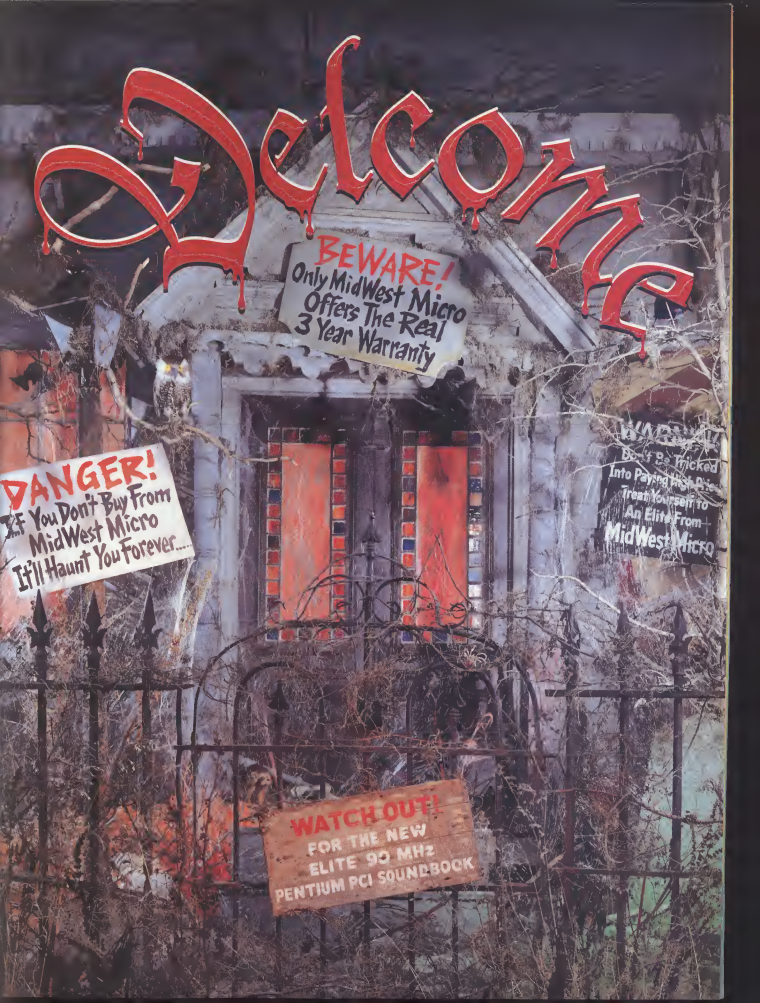
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HP LJ IIP, IIP Plus		-	-	299	399	-	-	-	-	-	-
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IBM 4019, 4029, 4039		-	-	299	399	-	-	-	-	-	-
IBM 4019, 4029, 4039		-	-	-	-	399	-	-	-	-	-
IBM 4019, 4029, 4039		-	-	-	-	-	499	-	-	-	-
IBM 4019, 4029, 4039		-	-	-	-	-	-	599	-	-	-
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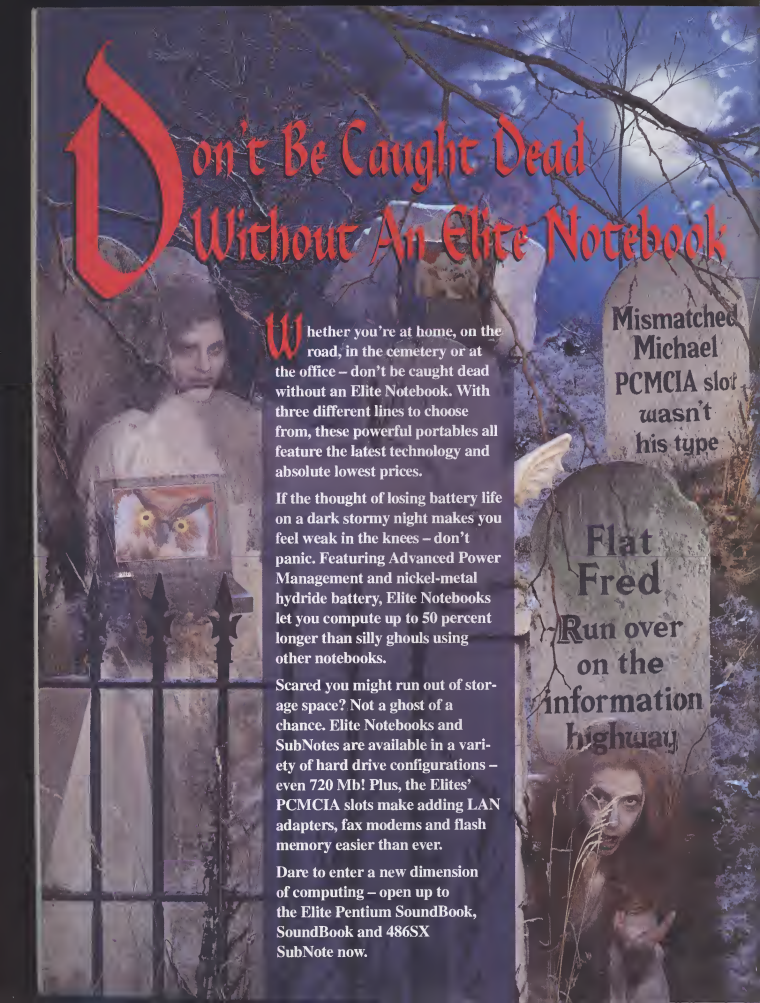
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Drained Darryl
The battery life on his Elite lasted longer than he did.
Businessman Bob
Died from
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Survived by
Pentium
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MidWest Micro's Supernatural SubNote

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No bones about it, every cool ghoul owns an Elite 486SX SubNote. This 3.9 lb. thriller is lurking with features like upgradeable RAM, a large hard drive and Advanced Power Management. In fact, the Elite's nickel-metal hydride battery lets you compute up to five hours on a single charge. (That ought to lift anyone's spirits!)

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- Built-in Trackball
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- Advanced Power Management with SMM
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- External VGA & Keyboard Port
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Options

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PCMCIA 14.4 Fax Modem	#001812	$179
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Dying for a notebook with built-in sound capabilities? MidWest Micro's Elite SoundBook is a real scream! Featuring a microphone, speakers and bundled audio software, this powerful notebook is waking the dead.

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Be the ghost with the most – order your Elite SoundBook now!

Elite SoundBook

- Intel 486, DX2 or DX4 Processor
- 4 Mb RAM (expands to 20 Mb)
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- Local Bus Video with 1 Mb Video DRAM
- Business Audio Features Including: Built-in Microphone & Speaker
- External Jacks for Line In & Line Out
- 3.5" Built-in Disk Drive
- User Replaceable Hard Drive
- Two Type II/One Type II PCMCIA Slot
- Built-in Trackball
- NiMH Battery & AC Adapter
- Advanced Power Management
- One Parallel & One Serial Port
- External VGA & Keyboard Port
- MS-DOS 6.22 & WFW 3.11
- Lotus Organizer
- Weight: Mono – 6.2 lbs. Color – 6.7 lbs.
- Carrying Case
- One Year Manufacturer's Warranty

Dual-Scan Color SoundBook

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Trick Or Treat, Pentium's Neat. Now It's In Our New Elite!



Here's a real treat – now you can experience the power of Pentium in the *NEW* Elite Pentium SoundBook. Even demons and vampire bats can't stand up to *this* monster of a notebook! With the Elite's hair-raising 90 MHz processing speed and PCI Local Bus, mobile computing takes on a whole new presence.

Cackling witches, screeching owls, wailing banshees... where are these sounds coming from? Pull the covers off your head, your house isn't haunted – it's the Elite Pentium SoundBook! Featuring a built-in microphone and stereo speakers, this 6.8 lb. hobgoblin sends chills up anyone's spine. That's right, and with bundled audio accessory software, you can record and playback the scariest music, voices and sounds.

What? You don't believe in things you can't see?

Well, one look at the Pentium SoundBook's display and you'll be shivering with excitement. Using PCI Local Bus Video, MidWest Micro's Elite delivers colorful visions on 10.3" dual-scan and 10.4" active-matrix screens. Plus, the Pentium SoundBook's mysterious high-tech Track Point Style pointing device will thrill you with total control (maybe tomb much control)!

You don't need permission from your mummy. Call MidWest Micro today and possess your own Pentium SoundBook.

Elite SoundBook Plus Based on Intel's Pentium® Processor

intel inside pentium™

- Intel® Pentium™ 90 MHz Processor
- 64-Bit, 256K Synchronous Burst External Cache
- 64-Bit, 8 Mb RAM (expands to 40 Mb)
- 10.3" Dual-Scan or 10.4" Active-Matrix VGA Display
- PCI Local Bus Video with 1 Mb Video DRAM
- PCI Local Bus HDD Controller
- 16-Bit Stereo Audio (Sound Blaster & Windows Sound System Compatible)
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- External Jacks for Line In & Line Out
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- User Replaceable Hard Drive
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- External VGA & Keyboard/Mouse Port
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- Microsoft Works for Windows™ 3.0
- Lotus Organizer™
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- Carrying Case
- One Year Manufacturer's Warranty

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- Digital Quality Speakers
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- 3.5" Disk Drive
- 14" SVGA 28 Mil Color Monitor w/Hitachi CRT
- Slimline Case
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- Digital Quality Speakers
- 14.4 Internal S/R Fax Modem
- 3.5" Disk Drive
- 15" SVGA 28 Digital Color Monitor w/Hitachi CRT
- Slimline Case
- 4 ISA & 1 VESA/ISA Slots
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- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- EPA Energy Star Compliant
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- Altec Lansing Digital Quality Speakers
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- 8-Bay Mini-Tower Case
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- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
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- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
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- 15" SVGA 28 Digital Color Monitor w/Hitachi CRT
- 8-Bay Middle-Tower Case
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
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- Double Speed CD-ROM Drive
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- 3.5" Disk Drive
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- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Works Multimedia Edition 3.0
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- Super I/O using 16550 UART & ECP/EPP
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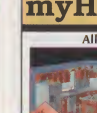
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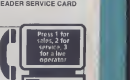
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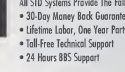
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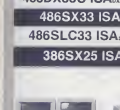
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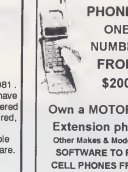


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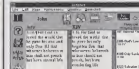
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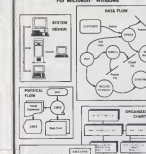
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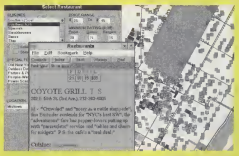
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What do Leonardo da Vinci, Donna Reed, Englishmen in drag, Perry Como, and little green men have in common? Answer: These days, they're all on CD-ROM. And not just any CD-ROM. The crop this month is filled with inventive and skillfully done discs. The CD makers are finally figuring out how to do this.



It's a Wonderful CD-ROM: So absorbing, you'll smell Zuzu's petals.



IT'S A WONDERFUL LIFE ●●●●●

It's not enough that *It's a Wonderful Life* will be shown 5,832 times on TV in the next two months. Kinesoft's presentation of the Christmas favorite is still worth getting. In addition to the movie on two Windows discs, you get the final script linked to each scene in the movie, reviews, trailers, stills, and the short story it's based on. The best set of multimedia controls I've seen lets you change the volume and the size of the display—up to full screen (although that's a bit chunky). You can search for words in the script and jump to the scenes in which they're used. You can even click on a button for spoken commentary on what you're watching. It's a fun way to explore an old favorite.

It's a Wonderful Life / Kinesoft Development / (708) 806-9562 / $79.95
Circle No. 785 on Reader Service Card

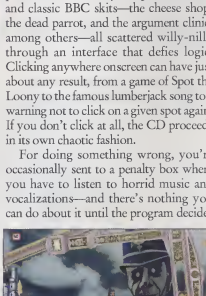


MONTY PYTHON'S COMPLETE WASTE OF TIME ●●●●●

And now for something completely insane, it's . . . Monty Python's Complete Waste of Time, a Windows CD that brings total anarchy to computing. The disc is a compilation of the comedy troupe's animation and classic BBC skits—the cheese shop, the dead parrot, and the argument clinic, among others—all scattered willy-nilly through an interface that defies logic. Clicking anywhere onscreen can have just about any result, from a game of Spot the Loony to the famous lumberjack song to a warning not to click on a given spot again. If you don't click at all, the CD proceeds in its own chaotic fashion.

For doing something wrong, you're occasionally sent to a penalty box where you have to listen to horrid music and vocalizations—and there's nothing you can do about it until the program decides to let you out. If you need help, press F1 for an endless stream of excuses for why you can't get any help. There's a collection of sounds, wallpaper, icons, and screen savers to totally Pythonize your PC. In addition, the disc has three arcade-style games. All are Pythonized, of course (try the flying pig shoot-'em-up for size), and one game has a bounty: Solve the puzzle, and you're eligible to win a multimedia PC or $5,000. But nothing tells you how to play this last game, or that it even exists.

If you're a Python fan, you have to have this CD. If you're not, why did you read all the way to the end of this long review?



Explode with Delight: Monty Python on CD-ROM—it's completely different.

Monty Python's Complete Waste of Time / Seventh Level / (214) 437-4858 / $59.95
Circle No. 786 on Reader Service Card



CHARLES J. GIVENS MONEY GUIDE ●●●

This Windows CD is a bit like eating your vegetables. After the rich stew of It's a Wonderful Life and the chocolate-coated delight of Monty Python, listening to a talking head's financial advice is like so much cold broccoli—good for you, but still cold broccoli. The Charles J. Givens Money Guide is designed sensibly enough. You're guided through a series of questions about your financial status and goals, then given specific advice for meeting these goals. For example, I can retire a millionaire through the simple strategy of investing $98,000 a year at 15 percent interest. Now, why didn't I think of that?

The multimedia element of this disc comes in the form of Charles J. Givens himself offering advice. Throw in a dozen or so simple programs for calculating finances, and you have a relatively decent program. Too bad getting rich isn't as much fun as Mr. Givens makes it sound.

Charles J. Givens Money Guide / Friendly Software Corp. / (800) 968-4654, (419) 868-6090 / $49.95
Circle No. 787 on Reader Service Card

PHOTOGRAPH BY JAMES McGOON

●●●●● *Taking the Concorde.* ●●●● *Riding the Orient Express.* ●●● *Driving a station wagon.* ●● *Walking to the 7-Eleven.* ● *Tripping down the stairs.*

UFO ●●●●

Still waiting for aliens from Alpha Centauri to beam you up to their mothership? Maybe you've been trying to get picked up in the wrong places. You need UFO, a Windows CD that contains a complete database of UFO encounters organized by place, date, number of flying saucers, and whether or not anyone was abducted. Based on the criteria you choose, a map pinpoints popular spots for the vacationing extraterrestrial. You can click on any of these spots to get details of past encounters, and many of the summaries include video or still photos. UFO: Don't leave Earth without it.

UFO / Software Marketing Corp. / (800) 545-6626, (602) 869-3377 / $59.95
Circle No. 788 on Reader Service Card

THE GRAMMY AWARDS ●●

This should be a great topic for a multimedia disc: music, TV, and high-gloss production values. But noooo. This DOS-based CD delivers only the minimum. In other words, most of it is text. Although the Help file mentions that sound and pictures are not available for 5 of the 34 ceremonies the disc covers, even when they are available, they're limited to a few still shots and the audio from the TV presentations. Something that claims to be a retrospective like this should at least include the complete version of each year's winning song. (Of course, when it comes to Perry Como singing his Grammy-winning "Catch a Falling Star," incompleteness can be a virtue.) If you're absolutely desperate for Grammy trivia, get it. Otherwise, spend your cash on music CDs.

The Grammy Awards / Compton's NewMedia / (619) 929-2500 / $49.95
Circle No. 789 on Reader Service Card

LEONARDO THE INVENTOR ●●●●

Leonardo was a cool dude. Anyone who could dream up diving suits, helicopters, tanks, and planes in a time when most people thought leeches were a miracle cure has to rank as a genius. If you doubt that, take a look at Leonardo the Inventor, a Windows CD that brings to life Leonardo's sketchbooks of ideas. The



Thanks to Leonardo: The works of history's most inventive southpaw.

CD animates his sketches, explains how his inventions would have worked, and shows video of modern-day applications of his ideas. And falling into a common trap, the CD includes some really lame and unnecessary games. Ignore them. (Someday CD publishers will stop thinking that fascinating information needs "support" from third-rate games.) One nice touch is the inclusion of 3-D glasses to enhance some of the animations. I'm sure Leonardo would have liked that. After all, he probably invented those, too.

Leonardo the Inventor / InterActive Electronic Publishing / (800) 472-8777, (914) 426-0400 / $49.95
Circle No. 790 on Reader Service Card

MAYO CLINIC FAMILY HEALTH BOOK ●●●●

This is hypochondriac heaven. Now you can find obscure causes for those pains and palpitations on one Windows-based CD. It took me no time at all to make several deadly diagnoses for the lump in my throat. (It was actually the beginnings of a common cold—not half as exciting as some of my own diagnoses.)

OK, you don't have to be a hypochondriac to appreciate Family Health Book. Even for people with only a normal interest in their health, the collection of videos, animations, narration, and text is a treasure trove of advice and warnings. The animations in particular do a spectacular job of explaining subjects. My only complaint is the feature for searching text: It's pretty coarse, and you still have to do a lot of scrolling to find exactly what you want.

Mayo Clinic Family Health Book / IVI Publishing / (800) 432-1332 / $89.95
Circle No. 791 on Reader Service Card

MICROSOFT COMPLETE BASEBALL ●●●●●

Do you miss the boys of summer already? Did you go into withdrawal when the players went on strike? If you believe baseball should last all year, you'll love this Windows CD. It's packed with statistics and lore of the game dating back to 1839, plus photos galore and even a few videos. And if this isn't enough for you, you can subscribe to *Microsoft Baseball Daily*, a newspaper delivered by modem for $1.25 an issue, to keep those statistics and scores up-to-date.

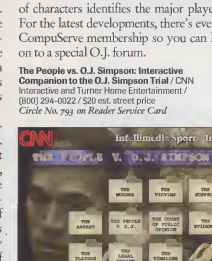
Microsoft Complete Baseball / Microsoft Corp. / (206) 882-8080 / $59.95
Circle No. 792 on Reader Service Card

THE PEOPLE VS. O.J. SIMPSON ●●●●

Are you an O.J. junkie, too? *Hard Copy* and the *New York Times* don't provide enough dirt for you to wade through? The fix is in—The People vs. O.J. Simpson: Interactive Companion to the O.J. Simpson Trial.

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The People vs. O.J. Simpson: Interactive Companion to the O.J. Simpson Trial / CNN Interactive and Turner Home Entertainment / (800) 294-0022 / $20 est. street price
Circle No. 793 on Reader Service Card



More Dirt: If you're not sick of all the media frenzy yet, get O.J. on CD.

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Circle 252 on reader service card.



I'M SICK OF THIS

PC Computing went a little loopy and gave me, a comedy magician, this page back when Hector was a pup. Hector is now way far beyond doggie adolescence and, in computer years, that's even longer. It's been a while. Everyone that hired me is gone. If Dvorak were to split, pink slip, or dirt nap, I think I would have the seniority at this damn rag. That's just wrong. I've never even seen my new editor face-to-face (although she has started writing to me about her martial arts class and that's only one step from "What are you wearing?" and on to e-sex.) My early columns suggested airbrushing naked-bulging biker babes onto one's computer, and cute directions for modifying your AUTOEXEC.BAT for the airport Checkpoint Charlie. (Metal detectors at the airport—our friendly neighborhood airports are starting to look like high schools, for Christ's sake.) You turn on your computer and the security lackey sees it counting down to detonation.

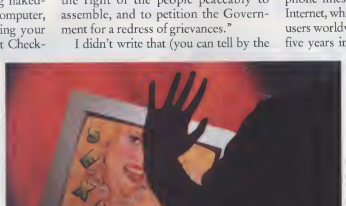
My early columns weren't political. (OK, so the airport security AUTOEXEC.BAT *did* bring a threat in the name of the FAA, but I think that guy was just a nut.) But now, with Clinton's Clipper, e-mail monitoring, security, software rating, Pretty Good Privacy, and so on, I'm getting pretty sick of trying to make jokes about issues I really care about. Only a dedicated professional could keep banging out the Uma Thurman references.

Until I'm secure that we're going to keep our cyberfreedom, I can't bring myself to write about intuitive interfaces or word processing tips. Computers gave me hope for the simple pure freedom that I love about this country, and I can't just watch it slip away. I'll review my personal feelings on the government's involvement with computer communications: "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances."

I didn't write that (you can tell by the conspicuous lack of parentheses and Uma), but I did type it in from memory *(PC Computing* has fact checkers, so you'll never know how well I did). Man, I love that swinging little amendment.

I'm often accused of not writing about computers and that's right—government *should* have nothing to do with computers. It's not the government's business what you type unless it damages someone else's person, property, reputation, or rips off their intellectual property—and :) could also be grounds for incarceration. Computer communication deserves all the same rights and freedoms of older technologies, *plus* the rights that were promised and lost for the older technologies.

I had plans to do a funny column on passwords when I got this on the Net from AP—"Robert and Carleen Thomas, both 38, of Milpitas, Calif., were each convicted Thursday of 11 counts of transmitting obscenity through interstate phone lines via their bulletin board on Internet, which serves 25 million computer users worldwide. Each count carries up to five years in prison and a $250,000 fine. Defense lawyer Richard Williams said they will appeal. The couple was charged after a computer user in Memphis, Tenn., complained. . . . A Tennessee postal inspector testified he joined the bulletin board under a fake name and received the images in his computer in Memphis."



Computers gave me hope for the **SIMPLE PURE FREEDOM** *that I love about this country. . . . So let's just get the government* **OUT OF OUR NET.**

The Thomases sent "images of bestiality and sexual fetishes" over their BBS. Who cares? Who knew it was Memphis? No one got it that didn't ask for it! Graceland's postal inspector used *a fake name* to score the feelthy pictures from Robert and Carleen. If this ruling holds up—and the court's "community standards" for the ether can be the standards of anyplace that gets the Net—we got trouble.

I'm sick of writing about this freedom stuff, so let's just get the government out of our Net once and for all, and I'll get on to writing some computer jokes.

PHOTOGRAPH BY JAMES McGOON; ILLUSTRATION BY JERALD FRAMPTON

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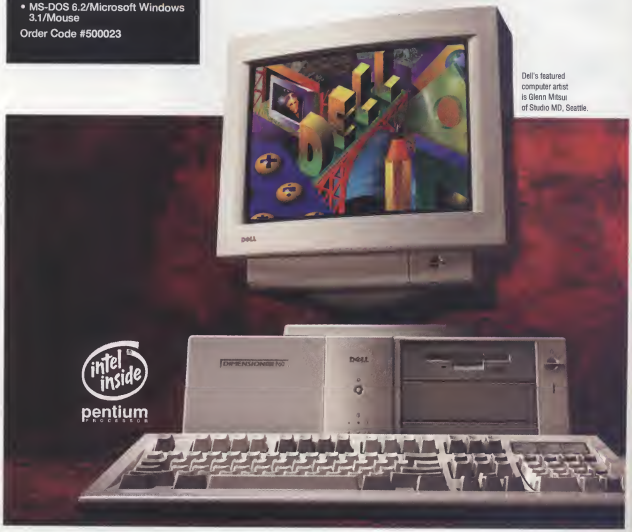
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